The Central Kalahari Bushmen : A Study of Ecological Anthropology(Dissertation_全文)

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主論文

THE CENTRAL KALAHARI BUSHMEN

- A Study of Ecological Anthropology

by

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PREFACE

During the 16 months from December 1966 to March 1968 and the 16 months from April 1971 to August 1972, I carried out a research project on the Bushmen who live in the Kalahari Desert in the southern African Republic of Botswana, the former English Protectorate of Bechuanaland which gained independence in September of 1966. The following text is the report of that project.

The first half of the project (1966-1968) was conducted as a part of the research program of the Kyoto University Primatological and Anthropological Expedition for Africa. The traditional research objective has been to discover clues regarding the transition from sub-human primate society--using the chimpanzee as the main focus--to human society. I have employed the opposite approach, focusing on the hunting and gathering society of the Bushmen, which is still at the most primitive structural level, and attempting to elucidate the original configuration of human society in order to discover the relationships between sub-human primate societies and human societies. The second half (1971-1972) was conducted as a member of the Harvard Kalahari Expedition.

First and foremost among the reasons I chose the Bushmen of the Kalahari Desert as my subjects from all the hunting and gathering peoples distributed over the globe is the fact that the Bushmen maintain a large population and that even nowadays many of them still live a life of hunting and gathering away from the influences of modern civilization, relying on primitive "stone age" techniques.

At present, when the so-called *primitive* societies around the world are quickly disappearing, the fact that a group of people with a population of several thousand is still living in the same fashion as human societies of almost 10,000 years ago is a miracle, although it can also illustrate the disadvantages of living in the Kalahari Desert.

This kind of Bushman existence offers important information regarding the daily life of early man, the reconstruction of his society and the evolution of human society. The environment of the Bushman is the strip of land bordering on the tropical rainforest, *i.e.* the savanna-woodland; fossils of *Australopithecus* and other ancestors of mankind have been discovered in similar environments stretching from eastern to southern Africa, and it is thought that this particular strip of land was one of the prominent sites where hominization took place. Moreover, though the

Kalahari is termed a desert on the basis of the yearly rate of precipitation, judging from the vegetation it is clearly a savanna, and it closely resembles the environment inhabited by the savanna chimpanzees. If we take into consideration the environment of the Bushmen habitat, research concerning their society and hunting and gathering way of life has still more value--it can be thought that it offers resource materials of greater importance.

In living a life of hunting and gathering under the direct control of nature, where the natural environment much consequently be confronted headon, the primary item which regulates society is food. For that reason, I made it the first topic of my research to thoroughly trace the dietary life of the Bushmen. With observations on the food-centered activities of the Bushman as a basis, I delineated the facts about *how they live*; and according to those realities, I considered the question of their adaptation: *how they manage to live*. In Bushman society social institutions are not yet very developed, and the level of social integration is low. In this kind of society, analyzing the kinship system and political system in themselves does not help to understand the essence of society. Only when the mode of existence of the society is understood as a product of social adaptation, and the various social institutions as forms of adaptations for the maintenance of society, does the analysis of those systems acquire significance. From this point of view, after discussing the problem of food, I deal with the structure of the group as an adaptation on a more social level.

Because of the difficulties offered by having to make various preparations and by the Kalahari Desert itself, the time I was able to spend with the Bushmen was not more than seven months in the first period of fieldwork and fourteen months in the second. That was too short an interval, and consequently several deficiencies are apparent in the subjects touched on by this report. In particular, it must be admitted that any discussion of the question of sex--along with food a very important topic as regards the continuing existence of man, whether treated on the biological level of sexual intercourse or on the social level of marriage alliances--is conspicuously absent. In relation to the dietary life of the Bushmen, observations spanning a greater length of time are necessary, and detailed demographic information covering the whole territory needs to be gathered. But we must wait for the next investigation to look into these problems.

According to my ecological research on the Bushmen, I intended to compare them with other hunting and gathering societies and investigate the development of human society. However, materials on the comparative ecology of other similar societies were extremely meager, and all I could do was carry out a few inquiries based on comparisons with a few other hunting and gathering societies such as the Northern Bushmen and the Hadza, and with chimpanzee materials. Again I have put aside this problem as a future topic.

J. Tanaka

Inuyama City,
May 1974

ACKNOWLEDGEMENT

It is a great pleasure to be able to thank at least some of the people and institutions who have made possible this study of the Kalahari Bushmen. In the performance of the research in the first period, there are many places where I relied heavily on the Hokkaido University Kalahari Scientific Expedition party; in addition, the Kyoto University Primatological and Anthropological Expedition for Africa accomodated me in many ways. The second investigation was supported by a grant from the U. S. National Institutes of Mental Health to Dr. Irven DeVore for "Studies in the Organization and Adaptation of Hunter-Gatherer Groups". This grant was administered by Harvard University. The Government of the Republic of Botswana was kind enough to issue a research permit to Harvard Expedition team and me.

Thanks are due to Dr.Trefor Jenkins, a staff member of South African Institute for Medical Research, Johannesburg, and his colleagues: Dr. George Nurse and Dr.M-C Botha, who cooperated with me in study of population genetics and demography, and who offered many facilities either in the institute or in the field. I owe a special vote of thanks to Mr. A.S. Wehmeyer, Head of the Division of Food Chemistry, National Food Research Institute of the South African Council for Scientific and Industrial Research, Pretoria, who has kindly done the nutrition analysis of the principal food plants of the Bushman.

A number of South African specialists in Bushman studies and related fields have contributed useful suggestions: Prof. John Blacking (ethnomusicology), Dr. H.J. Heinz (parasitology), Prof. Phillip V. Tobias (physical anthropology), and Dr. Tony Trail (linguistics) All of the above were on the staff of the University of the Witwatersrand, Johannesburg. Thanks are due, as well, to Mrs. A. Van Hoepen of the Government Botanical Gardens, Pretoria, for determinations of over 100 plant specimens.

I want to thank the officers of Botswana Government for their cooperation and hospitality, particularly Mr. and Mrs. Simon Gillett, the former District Commissioner of Ghanzi, Mr. Alec Campbell, Officer in the Game Department and Mr Peter Bladry, the former Police Commander in Ghanzi.

Thanks are also due to numerous Japanese people including Mr. and Mrs. Y. Ohata in Gaborone and Mr. and Mrs. H. Nanko in Johannesburg. And to the Bushmen themselves, with whom I spent twenty-two months: not only did I cause them many anxieties and troubles, but despite this they cheerfully

allowed me to stay with them and cooperated to help accomplish the goals of my study. For all of these things, I offer my deepest and heartfelt gratitude.

Professor Seiichi Izumi of Dept. of Cultural Anthropology at the University of Tokyo who passed away in 1970 and many other professors guided me through fundamental anthropological theories; and from many friends, as we engaged in intensive discussions, I received instructive suggestions and advice, I indebted to Miss Ryoko Okumura in my laboratory for typing this manuscript. I would like to express my appreciation to all of these people for the help they have given me.

Finally I am delighted to acknowledge my debt to Dr. Jun'ichiro Itani, a professor in Physical Anthropology Department of Kyoto University and head of the Kyoto University Expedition for Africa. This study has benefitted immeasurable from Dr. Itani's participation at every stage.

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CHAPTER 1 INTRODUCTION

1. The world of the Bushman

A huge, desolate, grassy plain spreads from the south-western part of the Republic of Botswana over eastern South-West Africa and into the north-western section of the Republic of South Africa. This region is commonly called the Kalahari Desert. Its area is about 1,150,000 sq. km. It is not at all what the name "desert" conjures up: as far as the eye can see, the sand is covered by tall grass and shrubs, like a savanna. Here and there, thinly scattered acacia trees ten meters or more in height spread their branches umbrella-like. In southern Africa such a region is usually called *bushveld*. At present there are practically no permanent bodies of water in the area, but formerly, up until around the late Pleistocene, there were water-bearing streams. The dry river beds called *molapo*[1] are found here and there; and the shallow, flat depressions known as pans[2], peculiar to this area, can be seen along the course of these *molapo* and scattered elsewhere in the *bushveld*. Along the banks of the *molapo* and around the edge of the pans stands an open woodland made up of acacia and a limited number of other species of trees, which is black with foliage during the rainy season. This large grassland lies about 1000 m. above sea level; it is remarkably flat, and as most of it is uniformly covered with grass and shrubbery, presents a truly monotonous vista. The only break in this monotony is that provided by the depressions of the scattered pans and *molapo* and the accompanying changes in vegetation.

It is on this desolate Kalahari plain that the Bushmen make their home, living by hunting and gathering wild animals and plants. A great majority of the Bushmen have already begun to assimilate to the culture of the white man or the Bantu tribes, with only a small segment still continuing its hunting and gathering ways in isolation from outside influence. The Bushman population of this region is estimated at a few ten thousands. Since the South African government will not permit investigations by foreigners (especially non-white) in the Bushman area of South or South-West Africa, I was limited to conducting my research in the Republic of Botswana. However, the majority of the Bushman population lives in Botswana.

The Republic of Botswana is a young country, having gained its independence on 30 September 1966; prior to that it was a British protectorate, Bechuanaland. Its area is approximately 570,000 sq. km., its population around 543,000 (1964 census), so that its population density is a low,

1 per sq. km., but this is due to the fact that the larger part of the country is occupied by the barren Kalahari Desert. Its climate is continental: very dry with great contrast of hot and cold. Almost the only industry is the raising of cattle, goats, and sheep, utilizing the Kalahari grasslands, although there is also limited cultivation of maize, beans, and the like. Otherwise there is only the mining of copper near Tati in the northeast, of asbestos in the Kanye region of the southeast and of diamond in Orapa of the east. Surrounded by the rich mining belt represented by South Africa, Rhodesia, Zambia, South-West Africa, etc., only Botswana, denied the blessing of great natural resources, remains undeveloped in southern Africa.

With only somewhat over 4,000 Europeans and Asians, Botswana's population is almost totally African but since the majority of the population is still at the tribal level of organization, a mountain of problems lies ahead for the young republic. The Bantus living there represent about ten tribes[3] in a loose order of dominance, from the traditionally strong tribes such as the Ngwato and Kwena down to the surrounding smaller and weaker tribes. The Bushmen who are in contact with various of the Bantu tribes in all cases seem to be content with a subordinate status in the relationship.[4]

2. Historical background

The Bushmen, along with the Hottentots (both groups belong to the Khoisan language family[5]), are believed to be the oldest residents of Africa among the surviving peoples. Both groups are thought to have been distributed over a much greater area before the European invasion of southern Africa.

The Hottentots lived mainly near the west coast, raising cattle as their main occupation but also hunting and gathering. It is also reported that one group living on the seacoast lived by fishing.

The Bushmen, on the other hand, lived in the south and in the eastern coastal region, living by bow-and-arrow hunting and plant gathering. From South Africa to Rhodesia there remain a great number of rock paintings or drawings and engravings, believed to have been done by the Bushmen over a period of several thousand years.

As to the question of how long the Bushmen have occupied their present site in the heart of the Kalahari Desert: since there are no rock faces to serve as "canvases", there are of course no rock paintings etc. left over from days of yore and hence no way of knowing the history of the area; but even assuming that the Bushmen were once much more widely distributed, we

can imagine that the Kalahari, being the area most unsuitable for life in all of southern Africa, probably had a very rarefied population density. It is likely that the main Bushman population was located in Cape Province, the Orange Free State, and the Transvaal, where the climate is mild and the rainfall abundant.

Since the seventeenth century, when Holland colonized the Cape as a transit point for the Indies trade, the Hottentots and Bushmen have been oppressed and forced to withdraw inland. The more friendly and gentle Hottentots attempted conciliation with the white men, and the large number of people of mixed blood living in the Cape Province today under the label of "Coloreds" reminds us of that period. The more bellicose Bushmen occasionally made war on the whites with poison arrows. The Hottentots too later carried on organized resistance, but both groups were unable to compete with the white man's modern weapons and were forced into retreat. Even today there are white farmers who will tell you in all seriousness that if you meet with a Bushman you will die by the poison arrow, but such beliefs are fast dying away. Until very recently, however, such conditions did exist in response to the white man's rule, and we can believe that the Bushman would have loosed his arrows at an unknown outsider.

Anyhow, as South Africa had turned out to be such a useful colony, the whites drove further and further north in search of living space and new lands, driving the Hottentots and Bushmen before them into the interior, killing as they came, until finally the whites ran into the Bantu driving south from eastern Africa. The Bushmen, caught between white and Bantu, suddenly found themselves on the brink of annihilation and were forced to seek survival in the Kalahari Desert. By a similar process, the Hottentots have survived only in a portion of the Kalahari and in South-West Africa.

At one time it was thought that the Bushmen had indeed died out, but in the nineteenth century, as missionaries, travelers, hunters etc. found their way to the heart of the Kalahari, word came back that they were still in existence. Some of the *Boers*[6] who made the Great Trek from the Cape to the north to colonize new lands set up farms in the Kalahari, employing a large number of the neighboring Bushmen as laborers. The Kgalagadi tribe,[7] forerunners of the Bantu who moved into this region shortly after the Bushmen, made their living grazing cattle, but the Boers chiefly concentrated on conciliating the Bushmen. The Boers felt that to leave the Bushmen alone would have been very dangerous; moreover, cattle rustling was not uncommon on the wide grazing lands. So by having the Bushmen, with their lack of

tribal organization and low level of economic awareness, live enclosed within the Boer pasture lands while working as common laborers, the Boers could kill two, or even three, birds with one stone. Today most of the Bushmen have become farm laborers and continued their servile status vis-à-vis the Bantu, having lost their traditional nomadic hunting and gathering existence.

The first systematic study on the Bushman was I. Schapera's classic work *The Khoisan Peoples of South Africa* (1930), but being based on the descriptions of missionaries, hunters, explorers, and travelers of the pioneer days, it contained many inaccuracies and ambiguities. The first anthropological research based on on-the-spot investigations did not appear until the 'fifties. L. Marshall and others dispatched by Harvard's Peabody Museum made four trips between 1950 and 1955 to study the Bushmen living in Botswana and South-West Africa. Most of her research dealt with the !Kung Bushmen living near Etosha Pan in South-West Africa (Marshall 1957, 1959, 1960, 1961, 1962, 1970). The Dzun/oasi of northern Botswana, a !Kung-speaking people, were the subject of research done by I. DeVore and R.B. Lee of Harvard's Department of Social Relations in 1963-4; they made a second trip in 1968-72 accompanied by a number of graduate students (Lee 1965, 1967, 1968, 1969, Lee and DeVore (eds.) 1968). Thanks to these researchers, the daily life of the !Kung is extremely well documented.

As for the Central Bushmen, G.B. Silberbauer, a social anthropologist from the University of Witwatersrand, conducted research on the G/wi of the Central Game Reserve for a few years starting in 1958 (Silberbauer 1963, 1965, 1972). As the District Commissioner of the Ghanzi District he conducted surveys dealing with the Bushmen for the government, but with his administrative duties was unable to spend any long stretch of time living among the Bushmen.

H.J. Heinz of the Medical School at the University of Witwatersrand conducted some ten years of wide-ranging and detailed research on the !Ko of the southern Kalahari, covering topics from social anthropology to ethnobotany (Heinz 1966, 1968, 1970).

3. Distribution and language

The present distribution of the Bushmen is limited to Botswana, South-West Africa, Angola, South Africa, and Zambia. According to Phillip Tobias, there are an estimated 31,000 Bushmen in Botswana, 20,311 in South-West Africa, 4,000 in Angola, 200 in Zambia, and 20 in South Africa, for a total

of 55,531 (Tobias 1956)

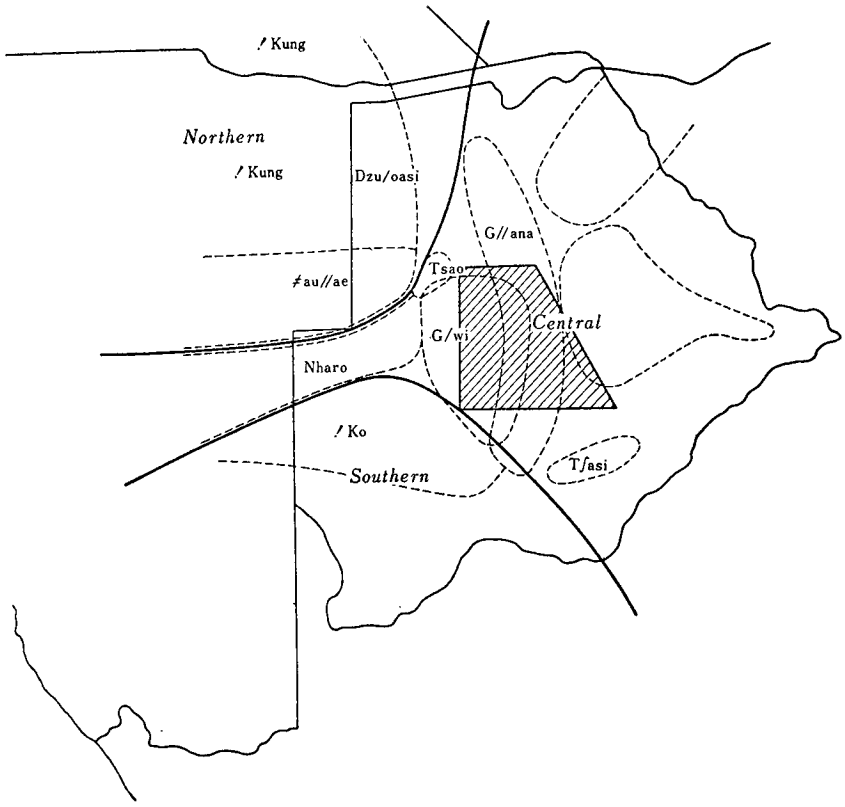
The present-day Bushmen can be divided linguistically into three large dialect groups, Northern, Central, and Southern (cf. Fig. 2). The Bushmen, with their hunting and gathering way of life, are distinguished thereby from the cattle-raising Hottentots. Linguistically speaking, however, the Central Bushmen are of Hottentot type: their language is closely related to Nama Hottentot. Physically, too, they show an affinity with the Hottentot: they are somewhat larger than the other Bushmen, and the women are steatopygous.[8]

The largest linguistic group among the Central Bushmen is the Nharo. Most of the Nharo speakers live in and around the town of Ghanzi, and the great majority of those working on the farms run by the whites in Ghanzi belong to this group. The Tsao are distributed slightly to the east of the Nharo and speak a language very similar to Nharo. To the southeast of the Nharo and Tsao, living in the Central Kalahari Game Reserve (henceforth "the Reserve"), are the G/wi and G//ana. The languages of the G/wi and G//ana are closely related, and their ranges overlap. A small number of G/wi and G//ana live on the farms of Ghanzi, but most of them lead a self-sufficient hunting and gathering life in the *bushveld* of the Reserve, isolated from outside civilization.

Among the so-called Northern Bushmen are the !Kung, who live around Etosha Pan in South-West Africa; on and near the frontier of South-West Africa and Botswana are such groups as the Dzun/oasi to the north and the ≠Au//Ae, who occupy a lateral zone reaching as far as Ghanzi. Although each of the various geographically distinct Northern Bushman groups has its own name, they all speak the same language, !Kung, and all have other striking similarities such as in kinship structure. In particular, in all Northern Bushman groups the inventory of personal names is limited to a few dozen, and as a rule a name is used in alternating generations. One's given name signifies one's place within the kinship structure which prescribes one's behavior. Accordingly, even when two people from widely separated areas meet for the first time, once they know each other's names they can determine each other's status (L. Marshall 1957, R.B. Lee personal communication). Most of the Northern Bushmen live self-sufficiently by hunting and gathering, but generally have contact with the Kgalagadi tribe around Ghanzi and the Herero[9] in the north and west.

The !Ko, Southern Bushmen, live in southern Botswana in an area extending from the Hanahai River to Tsane, and while many of them have close dealings with the Kgalagadi, a fair number still are hunters and gatherers.

Fig. 2 Distribution of Bushmen



4. The Central Kalahari Bushmen and their language

The G/wi and G//ana, who are the subjects of this treatise, live in a large area centered on the Central Reserve, reaching north to the south-eastern part of the Ghanzi farming region and south to the Kang, Tsetseng and Motokwe areas, home of the Kgalagadi tribe. Although there are those among them who have abandoned the traditional hunting-gathering existence to work on the white man's farms or tend the cattle of the Kgalagadi, the great majority still support themselves to a greater or lesser degree by hunting and gathering. The government built the one and only well[10] in the Central Reserve a few years ago, but other than that one spot the Reserve is devoid of drinking water most of the year. Many Bushmen therefore live in camps situated near the villages of the Kgalagadi tribe in order to have access to their wells. Although these people do hunt game and gather plants themselves, they rely on the field and dairy products of the Kgalagadi for a good deal of their food. The Bantu tribes living in the Kalahari are in general extremely friendly and good-natured, disliking quarrels, and the Kgalagadi are no exception. They show complete tolerance in the face of the parasitism and begging of the Bushmen.

Aside from the people who live in partial or total contact with outside civilization and are influenced by and obligated to it, there still remains in the center of the Reserve a group in excess of a thousand people who have practically no dealings with the outside world and maintain the traditional self-sufficient hunting and gathering way of life. They leave the Reserve at most once a year to go to the Kgalagadi villages, and then only when they need wire to make arrowheads, iron rods for spears and knives, etc. A man will save up a good-sized pile of steenbok hides to trade for the desired goods, then joining with a few others set out for Tsetseng or another Bantu settlement. The round trip may cover some 300 km., but to their well-tempered feet such a distance is a matter of only about a week's journey. When trade is not necessary they never leave the Reserve. In the trading villages, they may get together with some distant relatives and be treated to delicacies such as maize and milk; after a week or so, however, they get to worrying about their families and friends back in camp and set off hurriedly on their return journey. The main reason for their hasty return is that they do not feel comfortable among the masses of unknown people following an unfamiliar life style. They say that, after all, their own land, where they feel at home, is the best.

The G/wi and G//ana speak very similar languages, indeed have no trouble

understanding each other; there is also a sizeable overlap in their living ranges. Especially in the ǂKade area, the scene of my investigation, both groups mix and live together and often intermarry. Since it is impossible to differentiate clearly between the G/wi and the G//ana and observe their respective societies in isolation, I have decided to treat them as a single social group. Consequently, I will use the name Central Kalahari Bushmen (henceforth abbreviated to "CK Bushmen") to refer to both the G/wi and the G//ana.

As mentioned above, the CK Bushman languages are of the Hottentot type. The Khoisan language family, which includes Bushman and Hottentot as well as Hadza (or Tindiga), Sandawe and other East African languages of limited distribution, is distinguished by the extremely frequent use of click consonants. Clicks are particularly difficult to pronounce, and to one inexperienced at hearing them it is not even easy to say whether or not one was pronounced.

The twenty-seven phonemes of CK Bushman are as follows:[11]

a,b,d,e,g,h,i,j,k,m,n,o,r,s,t,ts,u,w,y,z

Of the above twenty sounds, the consonants can be pronounced as in English, save that the *g* is always hard, and the vowels have their European (e.g. Spanish, Italian) values.

/ : dental click. The tip of the tongue is pressed lightly between the upper and lower teeth as for English *th*, then quickly withdrawn: the resultant sound is similar to an American's click of the tongue.

ǂ : alveolar-palatal click. A fricative sound. The underside of the tip of the tongue is pressed firmly against the alveolar ridge and adjacent palate, then sharply released downwards.

! : palatal click. Press the tongue tip lightly against the upper palate and release sharply downwards. A dry sound like that produced when a cork is pulled suddenly from a bottle.

// : lateral click. Open the mouth widely as in pronouncing the French word *cet*; press the underpart of the tongue tip broadly and firmly against the upper palate, then release it sharply downward and slightly forward, the sound being produced at either side of the tongue. It resembles the alveolar-palatal click, but has a duller fricative sound.

ʔ : glottal stop. As when English *bottle* is pronounced with a Scottish accent as in *boʔle*.

x : guttural sound. Pronounced in the throat like Dutch *g*, or German *ch* as in *Bach*.

xx : guttural sound. Pronounced much more strongly than the preceding sound, with the mouth opened wide.

Also, the sounds *l* and *p* have recently entered the language through the Kgalagadi language, being used only in personal names and loanwords.

Bushman, like Chinese, has tones which can distinguish words with the same segmental phonemes.

Monosyllabic words are very numerous in Bushman; most other words are disyllables or trisyllables, longer words being extremely rare. Therefore, homonyms distinguished only by tone are quite common, as are mutually resembling words. Some examples:

/am sun
/am *Bauhinia esculenta* seed — homonyms
/am the number two — distinguished by tone
/am urine — distinguished by tone

tsam to approach an animal crawling on all fours
kxam mouth
kxxam to hit by club
kan the melon *Citrullus naudinianus*
!an to camp
!an to ripen; to cook or boil — distinguished by tone
!han to sew
ǂan to like; to think
!tan to stand
kuom the fruit of the *Grewia*
ku'om to listen; to understand — distinguished by accent
!kon to go
//kom to sleep
!on to go in search of food; to eat
/om bag
/om navel — distinguished by tone

The Northern and Southern Bushman languages, as well as Nharo, Tsao and some other Central Bushman languages, have the predicate directly after the subject, but only the CK Bushman languages place the predicate at the end of the sentence. In this and certain other areas - for example, in having postpositional particles of a sort - CK Bushman sentence structure closely resembles Japanese.

The verb is not inflected, but the preverbal element *kwa* alternates among *kwa*, *ki*, and *u* (or *ushi*) to correspond to present, past, and future

tense. The language has gender: generally speaking, masculine nouns take the suffix *-ma* and feminine nouns take *-sha* (or *-si*). Plural nouns are indicated by the suffix *-ji* (or *-haze*). Personal pronouns, besides singular and plural, also have a *dual* number within the plural to express the concept "you and I" (see Table 1).

5. Subject and methods of investigation

The Bushmen, like the Pygmies of the Congo Forest and the Negritos of Southeast Asia, are small in stature, their average height being about 155 cm. Their physical features are generally Negroid: black peppercorn hair, broad nose, etc. On the other hand, they also have many Mongoloid features, for example, yellowish brown skin, prominent cheekbones, slightly upturned eyes, and the Monglian fold. The buttocks generally protrude, and steatopygia is common among women (cf. Note 8). The women's *labia minora* are long and drooping and in extreme cases may reach 10 cm.; this is known as the "Hottentot apron". The man's penis is horizontal even when not erect.

The Bushmen were in the past often put in the Pygmy or Negrillo group, and a theory of Asian origin has also been propounded, but in fact their classification and origins are still a mystery.

The subject of my investigation is the G/wi and G//ana[12] living in the middle of the Central Reserve, out of touch with all outside cultures. As explained above, due to the similarities and intermingling between these two peoples, I have treated them as a single social unit, the Central Kalahari (CK) Bushmen. Of the two, the G//ana have had more contact with the Kgalagadi tribe, and there is much Kgalagadi blood in them, with the result that they have increased in stature and their skin color has darkened. In comparison with the G/wi who are predominantly "pure" Bushmen and among whom male and female have an average height of 159.2 cm. and 149.5 cm. respectively, the average height of the G//ana males is 164.3 cm. and that of the women 152.0 cm. (cf. Table 2)

There are a small number of G//ana who raise a few dozen goats for the meat and milk products, but the influence they exert on the eating habits of the Bushmen as a whole is negligible. Again, some G//ana cultivate the *tsama* melon (*Citrullus lanatus*)[13], but this in no way replaces the gathering of wild *tsama* melons and does not alter the overall Bushman food pattern. These habits of civilization were picked up by the G//ana from the Kgalagadi, and are not seen at all among the G/wi of the ≠Kade area.

I have called the area of my investigation ≠Kade after ≠Kade Pan, which

Table 1. Personal Pronouns

person	number	sex	subject	possess	object
first	sg.	M	ke	ki	kia
"	"	F	"	"	"
second	"	M	tse	tsa	tsa
"	"	F	se	sa	sa
third	"	M	abe	aam	ama
"	"	F	she	sha	asha
first	dual	M & M	achebe	achebe	achebe
"	"	M & F	akae	akae	akae
"	"	F & F	asebe	asebe	asebe
"	pl.	M	a≠ae	a≠a	a≠a
"	"	M & F	ite	ita	ita
"	"	F	ise	isa	isa
second	"	M	a≠ae	a≠a	a≠a
"	"	M & F	itoe	ita	ita
"	"	F	izo	izo	izo
third	"	M	a≠to	a≠to	a≠to
"	"	M & F	ane	ana	ana
"	"	F	aji	aza	aza

Table 2. Average Height and Weight of the G/wi and G//ana

a) G/wi

	average height(cm)	number of persons measured	average weight(kg)	number of persons measured
male	159.2	36	54.6	36
female	149.5	17	49.6	29

b) G//ana

	average height(cm)	number of persons measured	average weight(kg)	number of persons measured
male	164.3	15	54.3	9
female	152.0	19	50.8	15

is situated in the middle of the range of the CK Bushmen. It is located about 200 km. to the southeast of the Ghanzi farm belt, the latter being like an oasis in the middle of the Kalahari (cf. Figs. 3 and 4). Stretching across the flat, grass and scrub plain are the traces of a single long, straight rut: the road linking Ghanzi and ≠Kade. About 20 km. down along the banks of the Okwa Valley from ≠Kade Pan, at a spot called !Koi!kom, stands the area's only well, built by the government (cf. Note 10). This well, which uses a diesel engine to pump up the water, was my only source of water in ≠Kade.

To study the nomadic life of the Bushmen in the heart of such a wasteland, a truck was indispensable for getting and carrying food, water and other necessities, and for emergency trips to the outside. As much as possible, except for long trips and hauling goods, I carried out my research on foot.

For want of a person who could speak both English and Bushman, I was forced to use two interpreters, one who spoke English and Tswana and one who spoke Tswana and Bushman. This procedure, besides being laborious, made accurate communication impossible; moreover, the Bantu and Bushman who accompanied me from Ghanzi tended to be assimilated into Bushman life. Therefore, after four months I decided to dismiss them and rely on my own hopefully adequate command of the Bushman language, and for the remaining of the period I conducted the investigation by myself. I did research in ≠Kade for 7 months from 1 September 1967 to 31 March 1968 in the first fieldwork and for 15 months from May 1971 to 15 August 1972 in the second fieldwork.

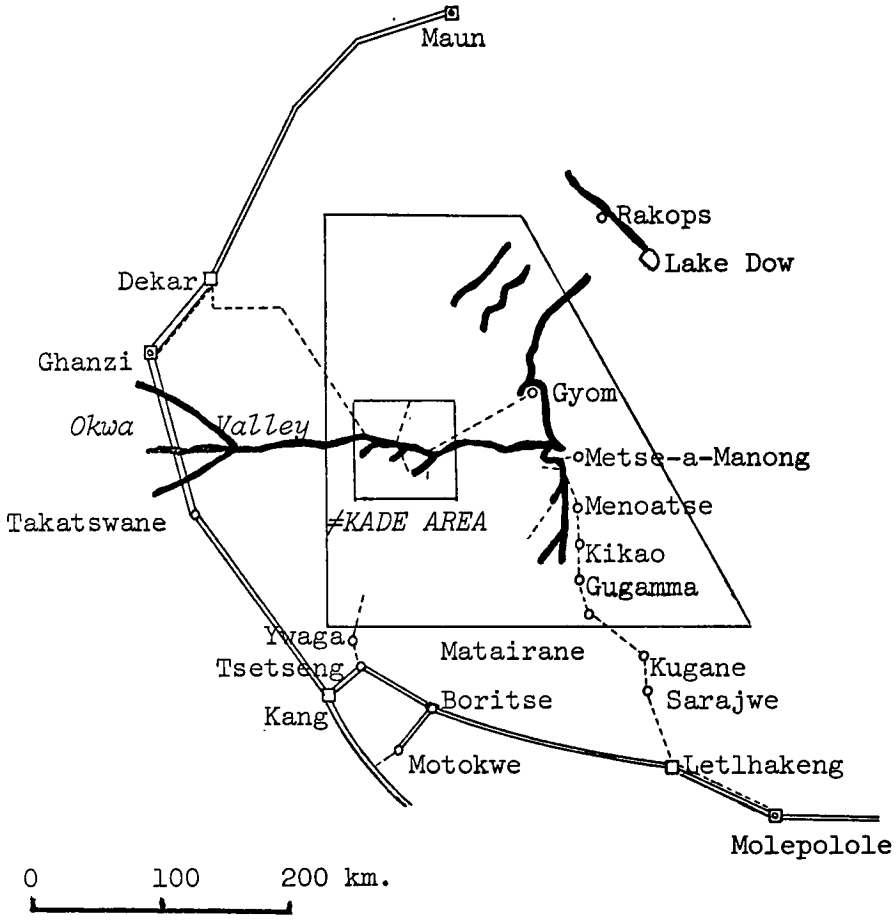
However, no matter how hard one studies the language and tries to imitate their daily lives, when it comes to lugging a mammoth load, living off wild plants and animals, walking over 30 km. a day on the hunt - nobody but a Bushman can do it. The investigator will never become one of them; he will always remain an outsider. I lived among them, shared their experiences and emotions, but in the end I could only observe them objectively from the sidelines.

Notes to Chapter 1

1. *molapo*. A Tswana word for the dry river beds of the Kalahari. Since these shallow, flat river beds are a feature unique to the Kalahari, I have not tried to translate the word *molapo*.

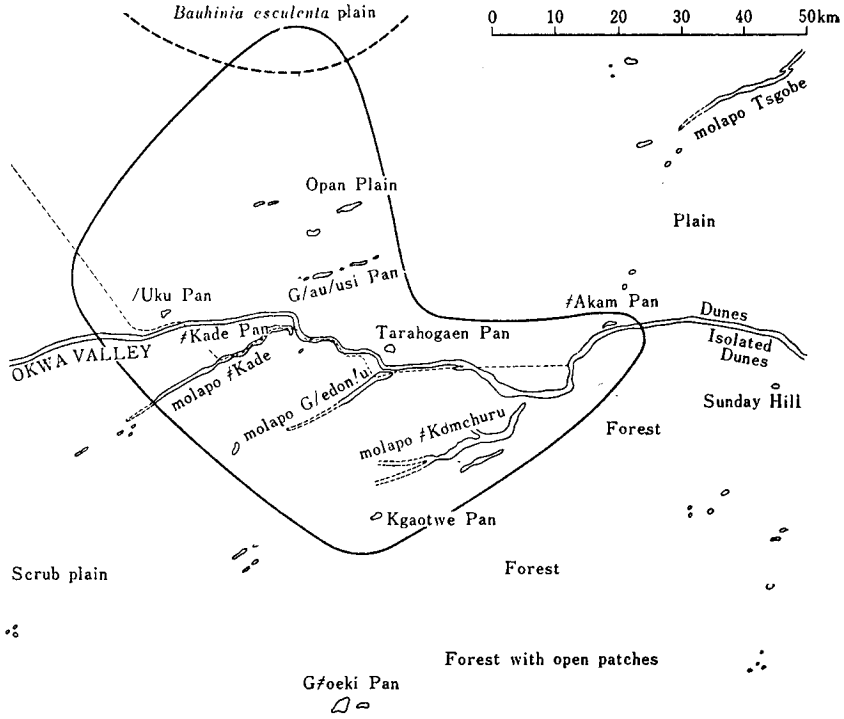
2. pans. The frying-pan-shaped dry lakes of the Kalahari, which once did hold water. During the rainy season the Bushmen and the wildlife of the

Fig. 3 Map of Range of the CK Bushmen



▣ : locations of District Commissioner's office
□ : towns
o : Bantu villages
----- auther's route

Fig. 4 The ≠Kade Area



Kalahari can find water in small pockets in these pans.

3. The Bantu tribes of Botswana, with the exception of the Herero, all belong to the Tswana of the Southern Sotho group. The name Botswana means "land of the Tswana", who make up the majority of its population.

The Tswana consist of a number of tribes; the main ones living in Botswana include the Ngwato, the Kwena, the Tawana, the Kgalagadi, the Ngwaketse, the Kgatla, and the Rolong.

4. Concerning relations between the Bushmen and the various Bantu tribes, see the studies by Silberbauer and Kuper (1966), Heinz (1968, 1970).

5. The Khoisan language family includes, besides Bushman and Hottentot, the East African Hadza and Sandawe, of limited distribution. The frequent use of clicks is a special feature of this family. Some Bantu languages such as Zulu and Xosa also use clicks, but these are thought to have been adopted from Bushman or Hottentot.

6. *Boer* comes from a Bantu word meaning "farmer" and was used chiefly to disignate the early colonists from the Netherlands. The *Boers* themselves dislike that appellation, preferring the term *Afrikaner*. Their language, called *Afrikaans*, is related to Dutch but contains elements of French, English, German and Bantu.

7. The Kgalagadi tribe is a branch of the Bantu, distributed over a wide area of southwest Botswana. Since the Bantu *g* is a guttural sound, their name sounds close to "Kalahari".

8. The Khoisan peoples in general have protruding buttocks, but the women often have an extreme amount of fat in that area, a condition known as *steatopygia*. It is especially widespread among Hottentot women.

9. The Herero live in the northern half of South-West Africa, from Ovamboland to Damaraland, and can also be found concentrated in the extreme northwest corner of Botswana. A few Herero also live in Ghanzi and Maun. Among the Bantu in Botswana, only the Herero do not belong to the Tswana subgroup. It is thought that they migrated from the western coastal region. They are larger in stature than the Tswana peoples, and the women wear long, brightly-colored robes adopted from the Europe of Queen Victoria's time. They are also called the Damara tribe.

10. The well was dug while Silberbauer was District Commissioner for Ghanzi. Government officials use the well when doing surveys in the Reserve, but since the water must be pumped up from great depths by diesel engine, the well is rarely utilized. I too used this well during my research period.

11. I am not a linguist and have had no training in phonetics, and the 27 phonemes given here are only a rough estimate based on the perceptions of a speaker of Japanese. A rigorous linguistic analysis would probably find many more distinctions, especially among the vowels.

12. The G/wi and G//ana peoples are usually called G/wikue and G//anakue, but since *kue* means "person", the shorter names seem more suitable as language names. They indicate their languages by suffixing the element *kxoi*, "language", thusly: G/wisikxoi, G//anasikxoi.

13. Cultivation of the *tsama* melon is common among the Bantu and has been borrowed by the Bushmen. While the wild *tsama* has a diameter of 15 to 20 cm., the cultivated variety reaches 30 cm. Many of the wild ones are bitter or sour; this never occurs in the cultivated variety, which is slightly sweet. Concerning the origin of the watermelon, Nakao writes that the wild plant most closely resembling the modern cultivated watermelon is *Citrullus vulgaris (C. lanatus)* of the Kalahari Desert, but that, considering the odds against cultivation in the Kalahari environment, the *Citrullus colocynth* of West Africa is more likely the ancestor of the watermelon (Nakao 1969). But in fact melon cultivation is widespread in the Kalahari.

CHAPTER 2 THE NATURAL ENVIRONMENT

1. Climate

The Kalahari, situated inland and near the Tropic of Capricorn, has a continental climate with scant rainfall and great variation in temperature. The dryness becomes worse as one moves west, until one crosses the mountains running north and south in South West Africa and enters the true desert known as the Namib. Since the Kalahari is on a plateau some 1000 m. above sea level, the summer midday heat tops 40°C. even in the shade, while in winter the strong cold winds blow in from the Antarctic Ocean, sending temperatures down close to -10°C. and producing frost every night (cf. Figs. 5 and 6, and Table 3)

The year is basically divided into a rainy and a dry season, the former from December to March, the latter from April to November; amount and period of precipitation varies from year to year. The five seasons of the Kalahari can be given roughly as follows.

Early summer: October - November. The end of the long dry season is the driest and hottest period. Midday temperatures are generally 37-38°C., sometimes over 40°C. The surface temperature of sand exposed directly to the sun rises to 60-70°C. The first rain usually falls in November and the plants begin to bud. This period records the year's highest temperatures.

Summer: December March. The rainy season. Downpours lasting from one to several days are frequent; plants grow well and blossom. But although this is called the rainy season, there may be periods of weeks with no rain.

Autumn: April - May. Rainfall declines and so do temperatures.

Winter: June - August. There is almost no rain and the mercury hits its lowest point. Freezing nights follow one upon another, plants wither, and verdure disappears from the Kalahari.

Spring: September. Very dry; temperatures rise steadily. With the rise in temperature, all the plants make preparations to bud during the coming rainy season.

Yearly precipitation varies between 170 and 700 mm., the average figure for the eleven-year period from 1961 to 1971 being 391.7 mm. (cf. Table 4). The rain is usually concentrated within a limited span during the rainy season, so that extended periods of rain are rare. As the

Fig. 5 Central Kalahari Rainfall, 1966-68
(from the Botswana Weather Research Bureau)

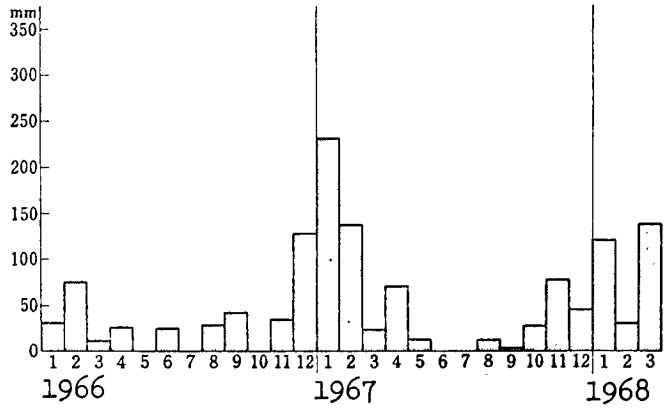
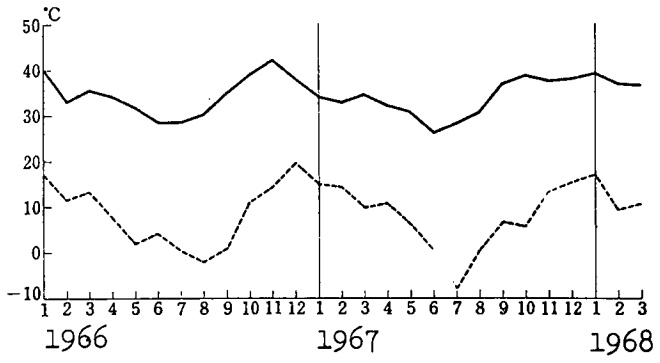


Fig. 6 Central Kalahari Weather, 1966-68
(from the Botswana Weather Research Bureau)



solid line; monthly highest temperature
dotted line; monthly lowest temperature

Table 3. Mean Maximum and Minimum Temperature of Each Month and Mean Daily Difference in Temperature of the Month

	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	mean daily difference yearly
mean daily difference monthly	26.3 (10)	26.2 (17)	29.0 (1)	36.2 (17)	37.8 (25)	36.5 (23)	36.1 (21)		34.6 (24)	33.5 (6)		30.0 (1)	
mean min. monthly	3.1 (10)	1.6 (20)	0.0 (1)	9.8 (16)	14.6 (25)	17.9 (23)	19.0 (19)		17.2 (22)	19.5 (6)		5.0 (1)	
mean max. monthly	22.9 (9)	24.0 (17)	29.0 (1)	26.6 (16)	23.0 (24)	18.4 (22)	16.9 (18)		17.4 (22)	14.6 (5)		25.0 (1)	20.8 (135)

Bracketed figures show number of days observed.

Table 4. Annual Rainfall in 11 years (1961-1971)

	'61	'62	'63	'64	'65	'66	'67	'68	'69	'70	'71	average
rainfall in mm.	381.0	252.1	788.9	171.1	304.0	359.3	626.0	580.7	260.3	323.2	257.7	391.7

rainy season approaches, many days find the upper sky covered with dark clouds, until finally they turn into black rain-clouds. Hardly ever do these black rain-clouds cover the whole sky, usually raining over an area of only a few dozen square kilometers. They move on slowly, raining on the areas they pass over.

Rainfall is extremely localized and at times varies greatly from place to place, which has a big influence on distribution and rate of growth of plants. In addition, once every few years a dry year will occur with only 100-200 mm. of rain (Silberbauer 1965, Botswana Weather Research Bureau materials). For example, from 1955- 1959 there were five consecutive dry years, and hundreds of Bushmen gathered around the wells in the Bantu villages (Tobias, 1964). In such years plant growth is bad and wild animals and livestock suffer great losses. The Bushmen of the Reserve, whose entire economic base is hunting and gathering, similarly experience hard times. Sometimes the Bantu leave their villages to go in search of wild plants, while conversely the Bushmen come to the Bantu and white man's settlements in search of water and food.

2. Topography, soil, flora and fauna

The Kalahari, situated on an extremely flat plateau about 1000 m. in elevation, boasts a monotony broken only by the pans and *molapo* and a few traces of sand dunes.

According to O.A. Leistner, more than 90% of the Kalahari is covered with the coarse red sand known as "Kalahari sand". The soil can be divided roughly into fine soil and sandy soil. In the low-lying pans and *molapo* a fine grayish soil has formed from an inflow of the surrounding fine soil as well as organic and mineral matter. It has a high pH and is rich in phosphorus, potassium and calcium, but its hardness makes it difficult for water to penetrate. The pans of this region are whitish salt-rich "calc pans". On the other hand, the soil around the pans and along the banks of the *molapo* is coarse-grained and whitish, becoming red as one moves farther from the pans and *molapo*. The change in color corresponds to the amount of iron oxides present. The whitish soil nearest the pans and *molapo* has a high pH and contains much organic matter and minerals, also being rich in phosphorus and potassium. As the sand becomes red, the mineral content drops and the pH lowers to almost neutral. Of the above soil types, the rough red sand called "Kalahari sand" predominates (Leistner, 1967).

In relating all this to vegetation, while soil fertility is of course

a factor, the really important question is: in the rain-scarce Kalahari, which soil can hold rainwater longest? Since evaporation after rain in the arid Kalahari is extremely rapid, the rough and permeable sandy soil is more suitable for plant growth than the fine hard soil which holds the water on the surface. The latter absorbs water so slowly that most of it evaporates. The rough soil, on the other hand, rapidly absorbs the water deep down and stores it; as the surface dries out through evaporation, the stored water slowly rises through capillary action. Consequently, the white sandy soil found in the slightly elevated areas bordering on the pans and *molapo* as well as along the ridges of sand dune remains, is the most amenable to plant growth, and it is there that the acacia woodlands are found.

For most of the year the Kalahari sees no rainfall; even with the short rainy season, yearly precipitation is scarcely 400 mm. The plants of the Kalahari have, however, adapted remarkably to this aridity There is almost no area completely bare of vegetation. Aside from the little depressions in the pans and *molapo* which may hold water for a day or two after a heavy rain, the lake and river beds are blanketed with species of grass which form a splendid food for herbivores. Moving from the center toward the banks, one gradually encounters more and more shrubs such as *Catophractes alexandri, Acacia melifera, A. nebrownii, Albizia anthelminthica,* and *Lonchocarpus nelsii*; basically, however, it seems to be a case of zonation as shown in Figs. 7 and 8. On the banks and the dunes one finds a wooland made up of *Acacia giraffae, A. luederitzii, Boscia albitrunca* etc., and beyond the forest a flat, open scrub plain - the *bushveld.* The so-called "open scrub plain" features shrubs like *Grewia flava, G. retinervis, Bauhinia macrantha, Boscia albitrunca, Terminalia sericea,* and *Lonchocarpus nelsii* scattered among one-meter-high grasses (cf. Figs. 7 and 8)

All of these plants except the evergreen *Boscia albitrunca* are either grasses or deciduous shrubs and trees which wither or drop their leaves during the dry season. To survive the long dry spell, a part of the leaves and stalks of almost all plants are replaced by thorns, while the roots and rhizomes become very developed as storage organs for water and nutriment.

In certain places in the Kalahari fissures in limestone outcroppings catch and hold water, or an underground vein of water comes close to the surface, so that natural springs and pools are made available, but no such permanent sources occur in the Central Reserve. Therefore the fauna of the Reserve is limited to those animals which can survive dryness.[1] Elephants

Fig. 7 Cross-section of *Molapo*

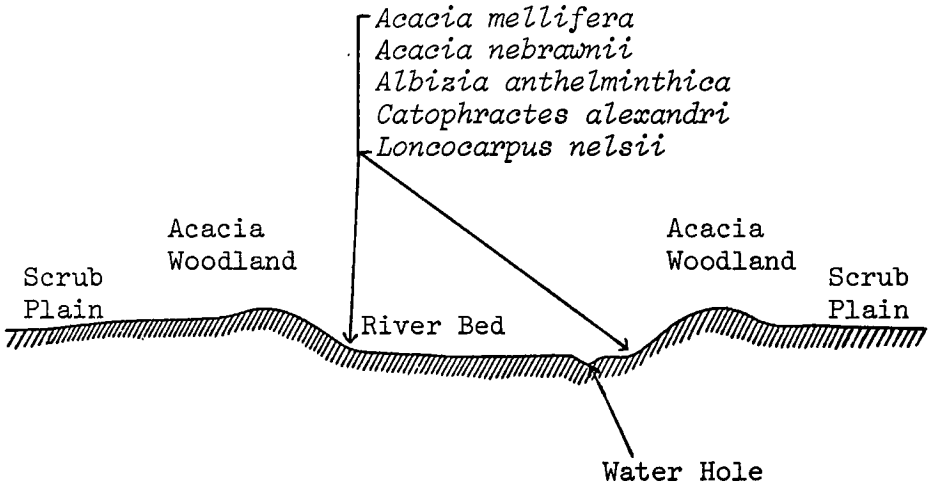
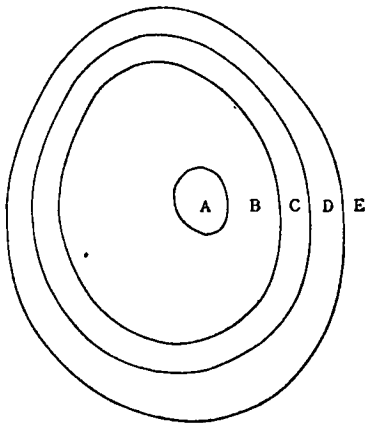


Fig. 8 Zonation of Pans, etc.



A: Bare surface
B: Grasses
C: *Acacia mellifera*
Acacia nebrawnii
Catophractes alexandri
D: Woodland
E: Scrub plain

and buffalo pass through the moister northern Kalahari on their seasonal migrations during the rainy season, and a few zebras may be found near the Reserve's northern border A few baboons and galagos are found, but not in the heart of the Reserve. Among primates, only man, who can dig up roots with a stick to get water, who can make many plants edible by the use of fire - only man can survive in the Reserve.

Notes to Chapter 2

1. It is reported that in 1964 when the government built a fence along the northern and eastern borders of the Reserve to prevent the spread of hoof-and-mouth disease and other livestock contagions, a large number of wildebeests, passing through the northern Reserve on their seasonal migration, were trapped to the south and west of the barrier and, unable to stand the dryness, died of thirst. Zebras have an even lower tolerance for drought than wildebeests and used to be found only in specific spots in the Reserve, but the drought of 1962 finished them off and now none are found in the Reserve.

Gemsbok and hartebeest have a greater resistance to dryness, but even these animals have become scarce in the face of indiscriminate hunting by rifle and because of the aforementioned fence.

Main plants of the Central Reserve [a]
(in alphabetical order)

	Scientific name	G//ana name [b]
1.	*Acacia erubescens* Welw. ex Oliv.	g//are
2.	*Acacia fleckii* Schinz	/kane
3.	*Acacia giraffae* Willd	//kara
4.	*Acacia hebeclada* DC. subsp. *hebeclada*	n//a
5.	*Acacia luederitzii* Engl. var. *luederitzii*	go
6.	*Acacia mellifera* (Vahl) Benth subsp. *detinens* (Vahl) Brenan	//kowa
7.	*Acacia nebrownii* Burtt Davy	//ari
8.	*Adenia repanda* Burch Engl.	/owarama
9.	*Albizia anthelminthica* (A. Rich.) Brongn.	kxaru
10.	probably *Aloe littoralis* Bak.	≠oru
11.	probably *Aloe zebrina* Bak.	≠oru
12.	*Aristida meridionalis* (Stapf) Henr.	/ona
13.	*Bauhinia esculenta* Burch.	/am, /oi
14.	*Bauhinia macrantha* Olix.	n≠an≠te
15.	*Boscia albitrunca* (Burch.) Gilg and Ben	n/one
16.	*Brachystelma* sp.	//ore
17.	*Brachystelma* sp.	//kaya
18.	*Brachystelma* sp.	//ao
19.	*Caralluma krobelii* or *C. Lutea*	dadaba
20.	*Casia biensis* (Steyart) Mendoncanea & Tarve	go/wa
21.	*Catophractes alexandri* D. Don	g!ag!aba
22.	*Cenchrus ciliaris* L.	?
23.	*Cephalocroroton puschelii* Pox	n≠enagu
24.	*Ceropegia* sp. ?	//a
25.	*Ceropegia* sp. ?	d//okogam
26.	*Citrullus lanatus* (Thunb.) Mansf.	n//ann
27.	*Citrullus naudinianus* (Sond.) Hook. f.	kan
28.	*Clerodendrum uncinatum* Sching	gyuag//a
29.	*Coccinia rehmannii* Cogn.	/a
30.	*Coccinia* sp. cf. *rehmannii* Cogn.	?
31.	*Commiphora africana* (A. Rich.) Engl.	za
32.	*Commiphora angolensis* Engl.	!kana
33.	*Commiphora pyrcanthoides* Engl.	/u

	Scientific name	G//ana name
34.	*Commiphora* sp.	?
35.	*Corallocarpus bainesii* (Hook. f.) A. Meeuse	/ʔorogu
36.	*Cucumis anguria* L. var. *longipes* (Hook. f.) A. Meeuse	nǂannǂarugu
37.	*Cucumis kalahariensis* A. Meeuse	om/e
38.	*Dichrostrachys cienerea*	/oen
39.	*Dipcadi marlothii* Engl.	g!om
40.	*Dipcadi viride* (L.) Moench	n!au!kari
41.	*Ehretia rigida* (Thunb.) Druce	g//a
42.	*Eragrostis pallens* Hack.	!kaba
43.	*Eriosema cordatum* (E. Mey)	gǂao
44.	*Eriospermum* sp.	ǂkon/uru
45.	*Eulophia hereroensis* Schltr.	!kauguna
46.	*Grewia avellana* Hiern.	n//o!ori
47.	*Grewia flava* DC.	kxom, !kaba
48.	*Grewia flavescens* Juss.	/ore
49.	*Grewia retinervis* Burrett	//kane
50.	*Huerniopsis decipiens* ?	//kaya
51.	*Indigofera bainesii* Bak	//okan
52.	*Ipomoea* sp. ?	/iki
53.	*Kedrostis foetidissima*	chunane
54.	*Kyllinga alba* Nees	/oen
55.	*Lonchocarpus nelsii* (Schinz) Heer. and Grimme	ǂkam-a
56.	*Loranthus oleaefolius* Cham. and Schltnd.	g/ui
57.	*Neorautanenia amboensis* Schinz	g//ao
58.	*Ochna pulchra* Hook.	kera
59.	*Ornithogalum amboensis* Schinz	ǂagubu
60.	*Oxygonum alatum* Burch	n//au
61.	*Panicum coloratum* L.	!taog/a
62.	*Pergularia daemia* (Forsk.) Chiov.	murahari
63.	*Raphionacme burkei* N. E. Br.	bi
64.	*Rhigozum brevispinosum* O. Kuntze	ta
65.	*Sansevieria scabrifolia*	g!ui
66.	*Schmidtia pappophoroides* Stend.	/eg/a
67.	*Scilla* sp.	kyun
68.	*Scilla* sp.	kware
69.	*Scilla* sp.	g//ama

	Scientific name	G//ana name
70.	*Solanum rautenanii* Schinz	manchu
71.	*Stipagrostis uniplumis* (Licht.) de Winter	!ao
72.	*Strophanthus* sp.	≠taba
73.	*Strychnos cocculoides* Bak.	d/ua
74.	*Strychnos pungens* ?	!koba
75.	*Talinum crispatulum* Dinter	//kabe, //kape
76.	*Talinum tennissimum* Dinter	dam≠kagugu
77.	*Tenaris schultzei* (Schltr) Phill.	?
78.	*Terfezia* sp.	kuche
79.	*Terminalia sericea* Burch. ex. D. C.	g/a
80.	*Urochloa stolonfera* (Goossens) chippindall	?
81.	*Vigna longiloba* Burtt Davy	kare/azuru
82.	*Vigna parviflora* Welw. ex Bak.	xane
83.	*Vigna* sp.	/ide
84.	*Walleria* sp.	n//u
85.	*Ximenia americana* L.	g/ubi≠ori
86.	*Ximenia caffra* Sond.	≠ori
87.	*Ziziphus mucronata* Willd.	//karu
88.	?	kannagi
89.	?	g//ara
90.	?	gera
91.	?	!kon
92.	?	kyomkyuchu
93.	?	kuka
94.	?	/uru
95.	?	iyazadam
96.	?	xai
97.	?	/in/u

a) Identification of plant samples gathered in the ≠Kade area is due to Mrs. A. Van Hoepen of the Government Botanical Gardens, South Africa. The following books were also consulted: *Some Plants Used by the Bushmen in Obtaining Food and Water*, Robert Story 1958. *Trees and Shrubs of the Witwatersrand*, The Society of Southern Africa 1964.

b) The G/wi name is nearly always the same.

Main animals of the Central Reserve [a]

(* indicates those seen by the author)

	Scientific name	common name	G//ana name [b]
Class *Mammalia*			
	Order *Primates*		
* 1.	*Galago senegalensis*	lesser galago	?
* 2.	*Papio ursinus*	chacma baboon	/one
	Order *Insectivora*		
3.	*Erinaceus frontalis*	hedgehog	?
	Order *Chiroptera*		
4.	*Eidolon helvum*	giant fruit bat	hojarehojare
5.	*Chaerephon limbatus*	lesser free-tailed bat	hojarehojare
6.	*Scotophilus herero*	lesser yellow bat	hojarehojare
	Order *Carnivora*		
* 7	*Genetta genetta*	common genet	tsamba
* 8.	*Myonox cauui kalahariensis*	slender mongoose	g≠ari
9.	*Myonox nigratus*	black mongoose	g≠ari
10.	*Suricata suricata*	suricate mongoose	g≠ari
11.	*Mungos mungo*	banded mongoose	g≠ari
12.	*Helogale parvula*	dwarf mongoose	g≠ari
13.	*Cynictis penicillata kalaharica*	red meerkat	g≠ari
* 14.	*Hyaena brunnea*	brown hyena	n/utsa
* 15.	*Crocuta crocuta*	spotted hyena	//kyau
16.	*Proteles cristatus*	aardwolf	/i
* 17	*Felis caracal*	caracal	!teme
18.	*Felis lybica*	African wild cat	!koru
19.	*Felis serval*	serval	geerau
* 20.	*Acinonyx jubatus*	cheetah	!kao
* 21.	*Panthera pardus*	leopard	//koe
* 22.	*Panthera leo*	lion	hxam
* 23.	*Lycaon pictus*	wild dog	≠karu
* 24	*Canis mesomelas*	black backed jackal	g/ubi
* 25.	*Vulpes chama*	Cape fox	shuri
* 26.	*Otocyon megalotis*	bat-eared fox	//ka
* 27	*Mellivora capensis*	honey badger	garu

28.	*Ictonyx orangiae*	polecet	?
29.	*Ictonyx kalahariensis*	polecet	?
	Order *Nomarthra*		
30.	*Smutsia temminckii*	scaly anteater	?
	Order *Tubulidentata*		
31.	*Orycteropus afer*	antbear	gou
	Order *Parissodactyla*		
32.	*Eguus burchelli chapmanni*	Chapman's zebra (extinct)	
	Order *Artiodactyla*		
*33.	*Potamochoerus porcus*	bush pig	?
*34.	*Phacochoerus aethiopicus*	warthog	//to
*35.	*Giraffa camelopardalis*	giraffe	ng!abe
*36.	*Gorgon taurinus*	blue wildebeest	/e
*37.	*Alcelaphus caama caama*	red hartebeest	//ka?ma
*38.	*Oryx gazella*	gemsbok	/o
*39.	*Taurotragus oryx*	eland	gyu
*40.	*Strepsiceros strepsiceros*	kudu	gyowa
*41.	*Antidorcus marsupialis*	springbok	!kai
*42.	*Sylvicapra grimmia*	duiker	ng!owa
*43.	*Raphicerus campestris*	steenbok	g!aen
	Order *Rodentia*		
*44.	*Hystrix africae-australis*	porcupine	n//oe
*45.	*Pedetidae caffer*	springhare	g!yu
46.	*Geosciurus incuris*	ground squirrel	?
47.	*Clavialis woosnami*	kalahari dormouse	?
48.	*Gerbillus Paeba Kalahariensis*	paeba gerbille	?
49.	*Tatera schinzi*	shinz's gerbille	?
50.	*Dendromus* sp.	climbing mouse	n/one
51.	*Steatomys swalius*	fat mouse	n/one
52.	*Malacothrix typicus*	large-eared mouse	n/one
*53.	*Leggada minutoides*	dwarf mouse	n/one
54.	*Lemniscomys griselda*	single-striped fieldmouse	n/one
55.	*Rhabdomys pumilio*	striped field mouse	n/one
	Order *Lagomorpha*		
*56.	*Lepus capensis*	cape hare	juba
*57.	*Lepus saxatillis*	southern scrub hare	juba

Class *Reptilia*

*58.	*Python sebae*	common African python	/omma
59.	*Typhlops* sp.	blind snake	kyuho!dom
*60.	*Dendroaspis polylepis polylepis*	black mamba	iyazam
*61.	*Bitis arietans arietans*	African puff-adder	g≠ae
62.	Unidentified	giant lizard	?
*63.	Unidentified	leopard tortoise	g≠oe
*64	Unidentified	tortoise	dam

Class *Amphibia*

65.	Unidentified	toad	gue

Class *Aves*

*66.	*Struthio camelus*	ostrich	ng≠aru
*67.	*Numida meleagris*	guinea fowl	//kani
*68.	*Afrotis afra*	black korhaan	di
69	*Lissotis melanogaster*	black bellied korhaan	?
*70.	*Ardeotis kori*	kori bustard	/deu
*71.	*Francolinus levaillantoides*	Orange River francolin	?
*72.	*Francolinus adspersus*	red-billed francolin	?
*73.	*Streptopelia capicola*	Cape turtle dove	?
*74.	*Lophoceros flavirostris*	yellow-billed hornbill	?
	Many other birds		

Class *Arthropoda*

	ants	!oma/oma
	termites	?
	spiders	?
	scorpions	/kari
	many insects	

a) This list is based primarily on Silberbauer's 1965 report: *Report to the Government of Bechuanaland on the Bushman Survey*, G. B. Silberbauer 1965. The following book was also consulted: *The Mammals of Rhodesia, Zambia and Malawi*, R.H.N. Smithers 1966.

b) The G/wi name is nearly always the same.

CHAPTER 3 DIET AND FOOD PROCUREMENT

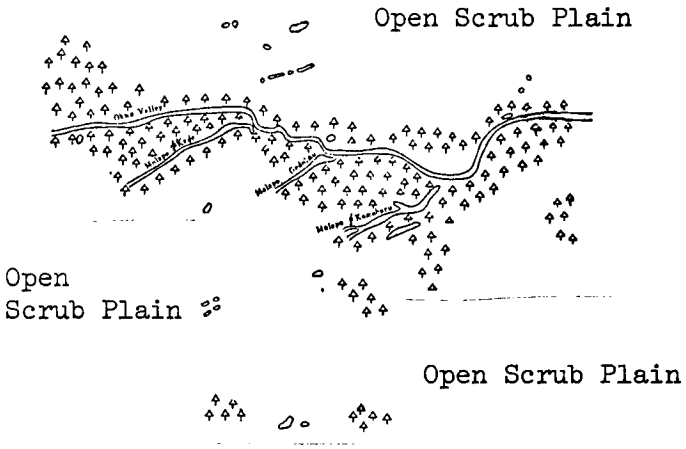
1. The ≠Kade area

There is a large valley which cuts through the approximate center of the Central Reserve, running east and west, called the Okwa. (The Central Bushmen simply call it */a* 'river'). At present, of course, the river is dry, and the bed is completely covered with a coarse, predominantly white sand. It is about 50 m. across and its bed is a few meters lower than the surrounding plain. In some places the river is over 100 m. across and more than 10 m. deep. At various places the dry streams called *molapo* run alongside the Okwa, much like tributaries, but the beds of all of these *molapo* are made up of a fine, hard soil, with occasional exposed limestone. The region in the approximate center of the Reserve where the three *molapo*, running parallel to each other, "flow into" the Okwa, is the ≠Kade area. With the presence of the Okwa, the *molapo*, and various large or small pans, the ≠Kade area is rich in its diversity of natural features, and such variations in topography and soil influence the area's vegetation (see Fig. 9) In the acacia woodland, firewood and timber to build huts is available in abundance, and relatively short-distance migrations from season to season permit the gathering of many kinds of plants. Also, drinking water can be obtained from the water accumulated after rainfall in the pans and *molapo*: and since herbivorous animals come to these same pans and *molapo* in search of water and the high-quality grass which grows thickly there, it is a good spot for hunting. For these reasons, the ≠Kade area has the highest Bushman population in the Reserve.

Number of Bushman whom I encountered in the period of my fieldwork reaches 528 (see Table 5). Of approximately 1000 Bushmen thought to live within the Reserve, about half make the ≠Kade area part of their range, and about 200 have been observed to live there more or less permanently. In the period of my investigation, I confirmed 221 Bushmen living there by the census in October 1971.

As to the change in population by birth and death in the area, I recorded the birth of ten and the death of six in the period of my investigation. Number of birth does not include a still-born child. Composition by age group of permanent residents in the ≠Kade area is shown in Fig. 10 and 11.

Fig. 9 Vegetation in ≠Kade Area



: Woodland

Table 5. Total Number of Bushmen encountered in the ≠Kade area, 9/67-3/68, 5/71-8/72

	married	unmarried		Total
male	143	116		259
female	137	113		250
sex, age unknown			19	19
Total	280	229	19	528

Fig. 10 Composition of the Bushman Population in the ≠Kade Area (1)

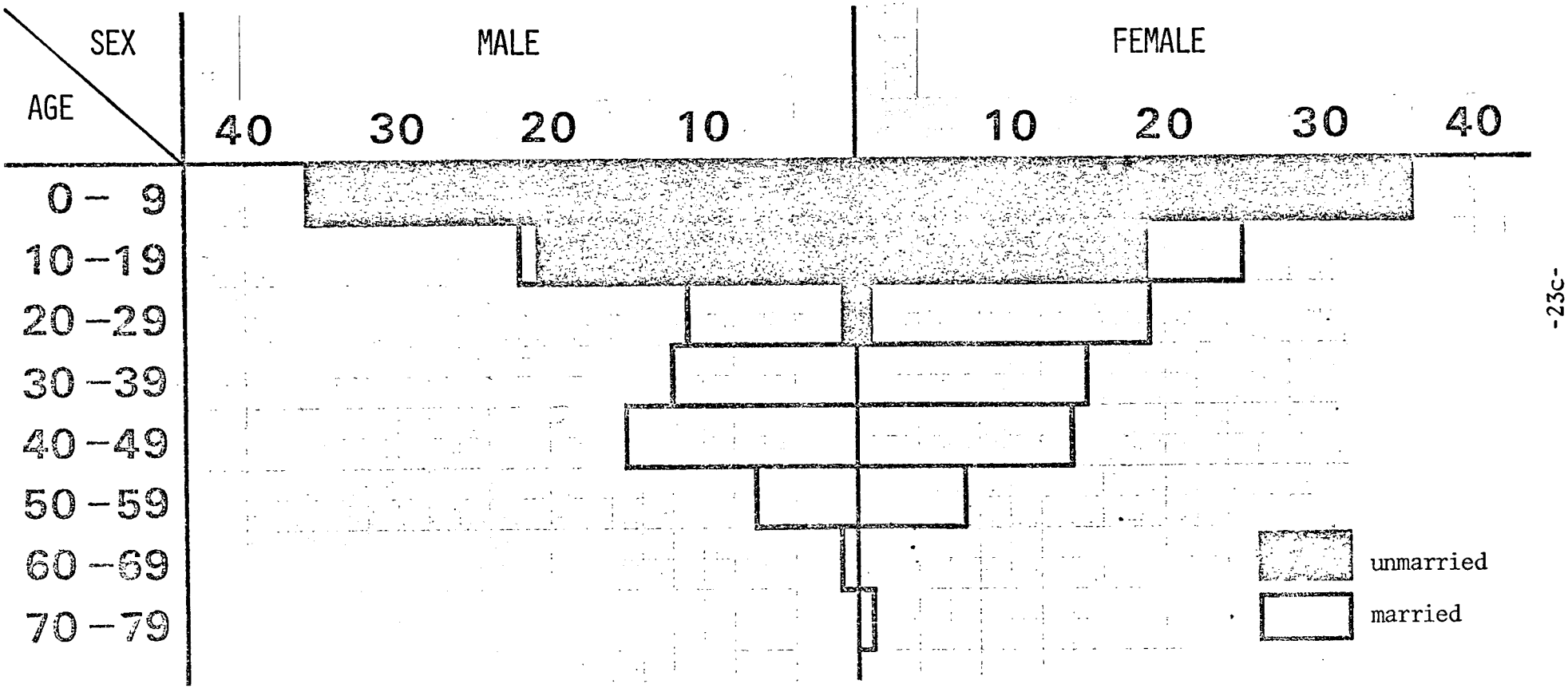
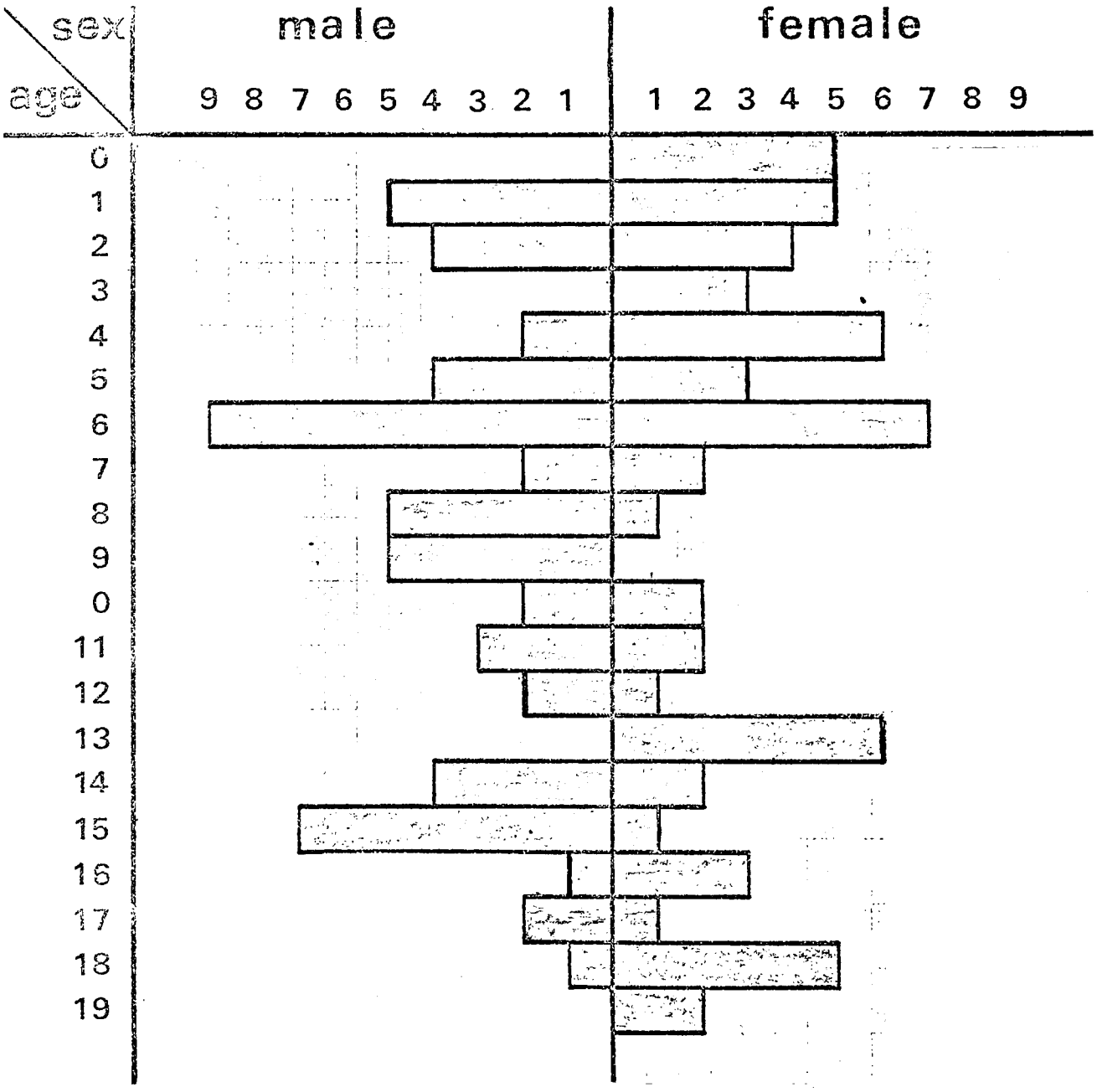


Fig. 11 Composition of the Bushman Population
in the ≠Kade Area (2) (under 19 years of age)



2. Dwellings

The Bushmen make their camps at a slightly elevated spot with an unobstructed view in the middle of the acacia woodland, where they can easily find trees for building materials and dead trees for firewood. People usually build a hut for each nuclear family, but an old person whose spouse has died usually moves in with one of his/her children. Camp sizes vary, also changing over time; the range seems to be from one family to about 20. The huts are usually arranged in a circle. Aside from the men's gathering the wood for the framework and bringing it back to camp, the work of building the huts is left largely to the women. The women, having arrived in the proposed camp area, select a new campsite in a suitable stand of trees near the decaying ruins of a camp abandoned many months earlier; then each builds a hut in a place that strikes her fancy. First she spreads grass and foliage over a circular area about two meters in diameter; then using the trunks and long branches that the men have brought, she makes a dome-like frame, sticking one end of each pole into the ground. The frame is then thatched over with tall grass growing nearby, leaving a space for the entrance, and the hut is ready. It is a small, crude piece of work, about two meters across and two meters high. It takes a good two or three hours of labor to put up such a hut, but unless rain is threatening, the woman does not build the whole hut at one time. After returning from their daily plant-gathering rounds, the women build at a leisurely pace while chatting happily among themselves. Moreover, they only do a little each day, so that it is usually four or five days after their arrival before the huts are finished. Since the entire covering is but a thin layer of thatched grass, ventilation is ideal, making this a very pleasant dwelling in the Kalahari, which is hot and dry most of the year. In times of rain the roof is thatched more thickly and with more care, and will not leak in anything sort of a real downpour. Only in winter, when the cold south wind blows, does the hut lose its charm; then the Bushmen build a small bonfire near the entrance and keep it going all night long for warmth. Except on rainy days and cold winter days, people do not build fires in the hut. Rather, they build a small outdoor fire near the hut entrance and do their cooking over it, and in general conduct most of their daily lives - handwork, conversation, etc. - outdoors. The crude hut is really nothing but a sunshade and windbreak, and one could say that the Bushman's true home is around the fire in front of his hut.

3. Daily life

The Bushman's day begins around sunrise. The people of the camp do not get up *en masse*, all together, but rather each rises at his own choosing after waking up. Each family cooks and eats the leftover meat and gathered vegetable from the day before, and then the men go a-hunting and the women a-gathering. Of course, when there is no food left from the previous day, they set out immediately upon rising. As a rule, labor is divided, the men hunting and making tools, the women gathering and cooking, but the men sometimes join in the gathering. The men will also occasionally pick and eat plants while out hunting, or pick and bring back something that caught their eye. On days when, instead of bow-and-arrow hunting, the men simply make the rounds of their snares, they usually finish within two or three hours of arising. Occasionally they work in terms of two or more, but usually each man goes his own way to inspect traps, hunt springhare, or search for larger game that must be brought down with bow and arrow.

The women, on the other hand, rarely go gathering alone, but usually set out in groups. At times all the women of the camp will even go out together. Compared with the men's hunting, the women often have some idea where to look for whatever plants they want - indeed they often set up camp in a spot replete with the desired plants; thus, they need not travel far and can finish their work in a much shorter time than the men. It is extremely rare for children to join the party: usually they stay in camp and play all day.

The pattern of hunting and gathering activities varies greatly with the season and the type of food sought. In the hot summer, the Bushmen go out only during the cool of morning and evening, usually spending the scorching midday napping or chatting in the shade of a tree. Conversely, in winter (around June and July) they venture out only during the midday warmth and stay in their huts huddled around the fire during the morning and evening.

The men's work pattern is irregular: after a day of hard labor on the hunt, they may spend the whole next day in camp resting, repairing or making tools, and so on. By contrast, all the women regularly spend a few hours gathering every day. The time spent gathering depends on the food: when melons and such are in season, barely an hour a day will suffice; but digging up roots or gathering small nuts or berries clearly takes much time. Naturally, when food is scarce and women must range farther afield, even more time is required.

Finally, as the sun begins to set, each woman builds a large cooking fire near her hut and commences cooking. Gathering firewood also is usually the woman's work, although the men often help in this. The hunters return to camp in the semi-darkness, and each family eats supper around the fire after darkness has fallen. Breakfast is sometimes omitted, and even when eaten is a light meal; during the day, too, while out working, the people eat only small amounts. Even when in camp, they merely snack at odd hours. Only in the evening does the whole family gather to eat a solid meal, and indeed the Bushman consumes the greater part of his daily food then. The only exception is after a big kill when a large quantity of meat has been brought back to camp: then the Bushmen eat any number of times during the day, keeping stomachs sated, until all the meat is gone. As long as there is meat hanging from a branch of a tree in the camp, nobody goes out hunting or gathering. All day long they lie around sleeping, joking and rolling with laughter, singing and dancing, and whenever they get hungry they cook some more meat and eat it. They never accumulate more food than they need. So if there are some fifty people in the camp, even if an antelope the size of a cow and weighing all of 300 kg. if brought in, they will pretty well dispose of it in a day.

After dinner is a time for rest and fireside socializing. The Bushman's greatest joy is chatting. They gossip, they slander, they argue among themselves. Most evenings are thus passed in talk of the day's events and plans for the future, until some time between nine and eleven they go off to sleep. The children, tired from a day of play. usually go to bed right after dinner. Sometimes, after dinner, the young girls will start singing, and the young men will surround them and begin dancing. The singing and dancing ends after an hour or so, but on occasion the adults join in and the dancing is continued far into the night. In a small camp with few people, dancing is not done, but in a larger, bustling camp, when meat from a big kill has left everyone satiated, it is not rare for the dancing to go on until dawn.

4. Hunting

Representative Bushman hunting methods include shooting large game with bow and arrow, catching small antelopes in a snare, and hunting the springhare with a hooked pole. If he owns a dog, the Bushman may hunt with a spear with the help of the dog; in the case of small birds or animals, he may beat them to death with a club or bring them down with a throw of a handy stick. Such beasts of prey as lion, leopard, cheetah and hunting dog

are "used" in obtaining animal meat. When the people observe a great number of vultures wheeling, they dash to the point and usurp the prey.

Bow and arrow hunting is surprisingly difficult and requires tremendous exertion. It is used mainly on large antelopes, but also giraffes, ostriches, duikers, steenboks, etc. Whenever the Bushman goes out he has over his shoulder a leather bag holding his bow, arrows, and spear, and as long as he is not out of poison arrows he is therefore ready to shoot whenever a target appears. Sometimes, after making the rounds of their snares, the hunters will loiter around a spot where gemsbok, eland, etc. are known to flock, meanwhile sticking their hooked poles into holes in the ground in search of springhare. The Bushmen sometimes walk 20 km. in a day over the practically shadeless *bushveld*. And yet, most days they return to camp emptyhanded. If by chance the hunter runs across a herd, or even just one animal grazing, he approaches from downwind so as not to be perceived by the animal. The Kalahari has few trees, and grass and shrubs a meter or so in height grow only in scattered spots, so that with the lack of cover it is extremely difficult to sneak up on game. Because the Bushman's bow is a small, crude device, he must approach to within about 20 m. of his intended. If he manages to get within range and to hit the animal with a poison arrow, and having ascertained that the poison part has penetrated firmly into its body, he must then observe the direction of the animal's flight and memorize its hoofprints. Shocked by its wound and the effects of the poison, the animal will flee for its life, and the Bushman must track it. Since game seldom approaches the campsite, hunting is usually done some 10 or 15 km. distant. The hunter who has scored a hit returns temporarily to camp. Until he confirms the death of the animal, he can take no food or drink other than water, for the Bushmen believe that if the archer eats food the wounded animal will regain its health and escape. That night the hunter sleeps in the camp, but the next morning before dawn he departs, accompanied by several young hardy men, and the tracking begins. Although pained by the poison coursing through it, the animal gives all its strength and flees practically in a straight line. Finally, weakening, it begins to seek shade and rest under some of the few trees to be found. As the distance between their prey's rest stops shrinks, the Bushmen know it is not far off. Soon they will find imprints of its body, as it can no longer rest on its feet but must lie down. Now, even if it should muster all its dying strength for a last run, it cannot go far. At last the hunting party will come upon the animal lying under a tree; if it is still breathing, they will approach with

their spears and, striking for the heart, administer the quietus.

Since dark is by now fast approaching, the hunters hurriedly skin the animal and chop up the head and limbs. The body is also chopped up into a load for each man. The horns are thrown away, but may be brought back to be used as an axe handle or the like. As for the rest, almost nothing is left behind except sometimes the contents of the stomach and intestines. If the hide is thick and untannable, like that of a large male antelope or a giraffe, it is sectioned and used as food; thinner skin is stripped off carefully so as not to tear it, and made into clothing or a carrying skin. The contents of the stomach are full of stomach acid and are sour and bitter, but in times of drought, they are a source of precious drinking water. The blood is poured into the stomach sac and hardened in the heat, making it easier to carry. The fat sticking to the membrane surrounding and supporting the intestines and blood is mixed and then stuffed into the duodenum and small intestine; the latter are then heated to make sausage. The liver, heart, kidneys, etc.; which spoil easily, are cooked and eaten on the spot; the meat on the ribs is also roasted and eaten for dinner that night. Since the Bushmen especially relish organs such as the liver and heart, these are the first to be cooked and eaten. The heart in particular is taboo for women: since it is believed that if a woman should eat it the men's hunting would be unsuccessful, it is almost never brought back to camp.

The men, having finally come upon some meat after a long food drought, usually spend the night at the scene of the kill; then the next morning each man shoulders his load of meat and they return to camp. If the animal weighed 200 kg., and assuming they actually carry back 150 kg. of that, then a party of five men would each have to carry 30 kg.; the camp might be from 15 to 30 km. away. Transporting such a load across the burning Kalahari is no joke. In the case of a giraffe weighing over a ton, the tracking may take three or four days, making the trip home that much longer, not to mention the additional amount of meat to be carried. In such cases the hunters will discard the bones, then cut the meat into strips and dry it, which reduces the carrying weight greatly. Drying also serves to prevent spoilage and preserves the meat.

It usually takes three to four days all told to bring in a large antelope. Even with all this effort, there are times when the poison works poorly and the prey escapes, or when a lion, leopard or other carnivore beats them to the dying animal. Bow and arrow hunting not only requires much exertion, it is also seldom rewarded. Neverthless, the hunters put

all their heart into it, encouraged by the prospect of getting all that meat at one time.

Compared with this, springhare and small antelope hunting is relatively easy. The springhare looks for food at night and spends the day resting in his under ground burrow, so a barbed pole about four meters long can be used to hook him. However, he cannot simply be pulled out: the hunter fastens the pole down at the entrance to the burrow, and after estimating the location of the springhare, digs straight down a meter or so and grabs him.

Small antelopes like the duiker and steenbok usually travel singly or in pairs, tending to follow predictable routes at certain times. They can be taken by a snare strung across their route. The men have five or six snares set at any one time and make an inspection tour every day. If it rains, the rope used in the snare becomes useless and must be changed.

5. Gathering

While plants make up the bulk of gathered food, small animals such as tortoises, ants, and various insects are also collected. The gathering of plants can be subdivided into the processes of *pi'ing* and *digging*. Which process is used depends of course on whether an above-ground part of the plant (leaves, stalk, flower, seed, fruit, resin, etc.) or a subterranean part (root, underground stalk) is sought. *Terfezia* sp., which grows just below the ground surface, can be dug out easily by hand, but with this one exception the gathering of rhizomes requires a digging stick. Among other primates, the chimpanzee has often been observed to use tools to obtain food, but never to go after roots that are far underground. Digging as a food gathering method, using a stick, is peculiar to man. The chacma baboon *Papio ursinus* is found in the Kalahari, but not within the range of the Central Kalahari Bushmen. This is probably because it cannot survive the period at the end of the dry season when, surface water being unavailable, water must be gotten from roots. Because he has added root foods to his diet, man is the only primate aside from the small arboreal galago that can live in this area. Digging with a stick is an important part of food gathering activity all through the year, and it is especially so around the end of the dry season, when most food and water is obtained from roots.

While hunting requires much practice and strenuous effort for scant reward, gathering plants is easy. since one knows where to find them and anyone can do it. Accordingly we can say that gathering forms the more stable part of the Bushman's livelihood. Of the two types of gathering,

digging obviously requires much more effort than picking, since one must sometimes dig down two feet or more. At any rate, from one to a few hours a day is devoted to gathering of either sort. In the case of plant gathering, and this is also true of big game hunting, part of the food will be eaten on the spot, but most is carried back to camp. Here it should be mentioned that *carrying* is an important element in gathering (as in hunting). The delay in consumption of food due to its transportation, and the need for pooling and redistributing food are important issues having a close connection with the rise of the human family. These questions will be taken up later; here it is sufficient to point out the fact that the large part of gathered or hunted food is brought back to camp through the use of carrying device. Among the various foods gathered, the bean, *Bauhinia macrantha*, is carried back still in the pod; the various species of tiny *Grewia* berries, about 5 mm. in diameter, are hard to gather and could most easily be eaten when picked, and yet more than half are brought back to camp in a sack. The discard rate for *Bauhinia macrantha* is the highest, with 75% useless parts; to obtain 5 kg. of edible beans one must carry back about 20 kg. of beans in their bulky pods.

6. Cooking

A fair portion of the Bushman's food is eaten raw, but most of it is cooked. Those foods eaten raw include the berries *Grewia* spp., *Ximenia* spp., *Strychnos cocculoides*, etc.; green vegetables such as *Scilla* spp., *Talinum* spp., and *Oxygonum alatum*; plants providing moisture, such as *Citrullus* spp. (melons), *Rhaphionacme burkei*, and *Aloe* spp.; and some of the root foods such as *Cucumis kalahariensis* and *Brachystelma* spp. Among the above, the melons and roots are usually eaten cooked, and the *Aloe* spp. are crushed in a mortar along with leaves and stems from other plants to squeeze out the moisture.

Cooking may consist of pan-frying or of baking directly in the fire. The pans are all iron, acquired relatively recently through trade. Before the introduction of iron pans, it is thought that the people probably either baked their food directly over the fire or in the middle of the hot ashes. Animal flesh is never eaten raw. When meat is cooked in a pan, it is fried for over an hour with a little water (for which melon pulp is often substituted); when it is so tender that the sinews will fall apart, it is usually crushed in a mortar The Bushman has no salt and uses no seasonings; on rare occasions, however, he will add a little antelope fat to improve the

flavor. When a pan is not available, the Bushman may bury a large piece of meat in the embers or hot ashes and leave it to bake for about an hour and a half. In addition, thinner pieces of meat can be cooked on top of the fire.

As to the plants: melons are pan-fried; when a pan is not available they are buried in hot embers or ashes as was the case with meat. When the flesh of the fruit is steamed through, the skin is discarded and the rest ground in a mortar and eaten as a gruel. All roots (except *Rhaphionacme burkei*) are cooked over the fire or in the ashes. The *Bauhinia macrantha* beans and the berries of *Ochna pulchra* are also cooked in the ashes, but as these are about 1 cm. in diameter and are hard to separate from the ashes and sand, a sieve woven of grass is used to separate the beans or berries.

Honey, which contains a lot of high-quality sugar, is a favorite of the Bushman but is a delicacy hardly ever to be found. It is eaten together with the larvae and the comb. A method of making wine from honey, practiced only when water is available, has been imported from the Kgalagadi tribe. This simple method consists in squeezing the honey from the comb, dissolving it in warm water and adding yeast[1], then leaving it for a day and a night to ferment. The same process can be applied to the juice of the berry *Grewia flava*. The result is a mildly alcoholic beverage.

7. Implements of livelihood

1. Bow (*kiesha*) The Bushman strips the bark from a *Grewia flava* trunk about 2 cm. in diameter and a meter long; then either end is shaved to a point. The bow is strung with a rope about 2 mm. thick made by twisting together tendons connecting the back and neck (i.e. *Musculi dorsi*) of a gemsbok or similar animal. The string is fastened on at either end with more tendon; another length of tendon is wrapped around the bow at a spot slightly removed from the middle to form a grip.

2. Arrows (*kxaosha*) The shaft, 7-10 mm. thick and about 50 cm. long, is made from the stalks of a cultivated plant[2] obtained in trade with the Bantu. The arrowhead is made from a piece of wire about 2mm. across, also acquired from the Bantu. One end of a 10 cm. length of wire is hammered flat and filed to a point, with no heat being applied. To make the nock, a piece of *Grewia flava* is embedded in the end of the shaft, then v-shaped notch is cut to fit the bowstring. No feathers are attached, so the flight of the arrow is rather inaccurate.

3. Poison (*g!ain*) To poison his arrows the Bushman uses the larva

of *Diamphidia simplex*. (A white insect living about 15 cm. underground, it surfaces during the rainy season to feed on the leaves of shrub *Commiphora*. The adult is not used for poison.) The gathered larvae are crushed and stored in a "poison jar." When needed, they are dissolved in juice from the root of *Indigofera* sp., *Coccinia rehmannii*, or the like, and the poison is ready for use. It is painted over all of the wire on the arrow except the very tip. The poison is extremely effective, but it takes 10-20 hours from time of entry into the bloodstream before the animal dies.

The bow and arrows are smaller than those used by other hunting tribes, and the bow is very weak; moreover, the arrow has no feathers attached to it. As a result, the Bushman seldom hits his target. The shooting range of the bow is about 20 meters.

4. Spear (*kxao*) The shaft is made from a peeled *Grewia flava* stalk about 1.5 m. long and 2 cm. thick, the point from an iron rod 1 cm. thick acquired in trade. It is rarely used as a throwing spear, usually serving as a secondary weapon to administer the *coup de grace* to dying game. It may also be used on slow, young animals or to stab small game flushed out by a dog.

5. Snare I (*g!ui*). A strong rope 2 m. or so in length is twisted from the fibers of *Sansevieria scabrifolia*; a small branch is fastened to the rope about 60 cm. from one end, to serve as a pin. When used, one end of the rope is tied to a small branch lopped from an approximately 2 m. long branch of the *Terminalia sericea*. A loop is made at the other end, where the pin was earlier attached, placed around a small pit dug in a path frequented by small antelope. When the animal's foreleg steps into the hole, the pin will come loose, causing the loop to tighten around the leg, and the *Terminalia* branch will act as a spring to hoist the animal into the air. When the rope is wet the loop will not close, so the snares are not used on rainy days.

6. Snare II (*tsipi*). This is a steel trap acquired in trade.

7 Springhare pole (*g!an*) The bark is peeled from a *Grewia flava* stalk about 1 cm. in diameter and 1 m. long; four or five of these are then tied together to make a pole about 4 m. long. The tip is cut diagonally and a steenbok horn tied to it. Recently it has become common to replace the horn with a steel hook about 5 cm. long.

8. Quiver (*n!osha*). Heat is applied to the root of the *Acacia luederitzi* (5-10 cm. across and about 80 cm. long), allowing it to be hollowed out and used as a quiver. One end is covered with raw gemsbok hide, and the quiver

is wrapped with animal tendons in three or four places for strength.

9. knife (*kxaoho*). Made the same as the spear point.

10. Axe (*n/ubi* or *bosha*). A trade good.

11. Club (*n/ba*). Made from a swollen section of root from *Rhigozum brevispinosum* or the like.

12. Digging stick (*n/ue*). Made by peeling the bark from a *Rhigozum brevispinosum* stalk about 2 cm. in diameter and 90-110 cm. long and then cutting one end diagonally. A simple tool, but one perfectly suited to digging down 50 cm. or so in the Kalahari sand. It is the most important tool.

13. Hunting bag (*!komasha*) Made from sewn steenbok hide. The four legs are fastened together to permit its being slung over the shoulder. A man always carries his hunting bag when he is out of camp. His bag will contain bow and arrows, spear, club, knife, fore stick, etc.

14. Carrying skin (*n/au*). Made from the hide of a gemsbok, or occasionally a springbok, hartebeest or wildebeest. About 1.5 m. by 1.5 m., it is used by women (rarely by men) to carry their gatherings. Both sexes also use it for clothing or a sleeping blanket.

15. Carrying net (*/ontsono*). Tendons of gemsbok, etc., are twisted into thread, which is then woven into a net about 1 m. by 1.5 m. The men use it to carry back meat.

16. Small pouch (*gyube*) A pouch about 30 cm. square is made from tanned steenbok hide. Besides holding small articles, it is also used in gathering *Grewia* berries and the like.

The above four items relate to carrying gathered food or children and are of importance in the rise of the human family, the evolution of human society, etc.

17 Water container (*≠kabi*). An ostrich egg shell.

18. Fire stick (*/e*). The rubbing stick is made from *Catophractes alexandri*, the receiving piece from *Grewia retinervis*. It is not as inconvenient as might be thought, producing fire in about a minute.

19. Pan (*//koe*). A cast-iron trade item.

20. Bowl (*xabasha*). Enameled trade item.

21. Cup (*n/ubi*). Enameled trade item.

22. Spoon (*i!kam*). A trade good, although a tortoise shell may also be used.

23. Fire-raking stick (*gure*). About 70 cm. long; made by shaving a

Boscia albitrunca trunk flat. Used in cooking to rake embers, ashes, sand.

24. Mortar (*iiko*) and pestle (*≠koa*) The mortar is a hollowed-out section of *Ochna pulchra* trunk, 20-30 cm. in diameter; the pestle is a piece of branch about 5 cm. across.

25. Sand sieve (*/aru*) A sort of mat woven of grasses, it is used to separate cooked beans, seeds, etc. from the ashes and sand which will pass through the sieve.

26. Dog (*aba*). The dog is the CK Bushman's only domestic animal and proves useful as a hunting tool. Large antelopes such as the gemsbok, and jackals, foxes, etc., are hunted by spear with the aid of the dog. Although the dogs are worked hard on the hunt, they are not usually fed except when, after a successful hunt, they receive some internal organs and scraps of meat, and so they are very skinny and often starve to death. Apparently they stave off starvation by catching insects and small animals. The keeping of dogs by the Bushmen does not seem to be a particularly recent development, but its origins are not known.

8. Water

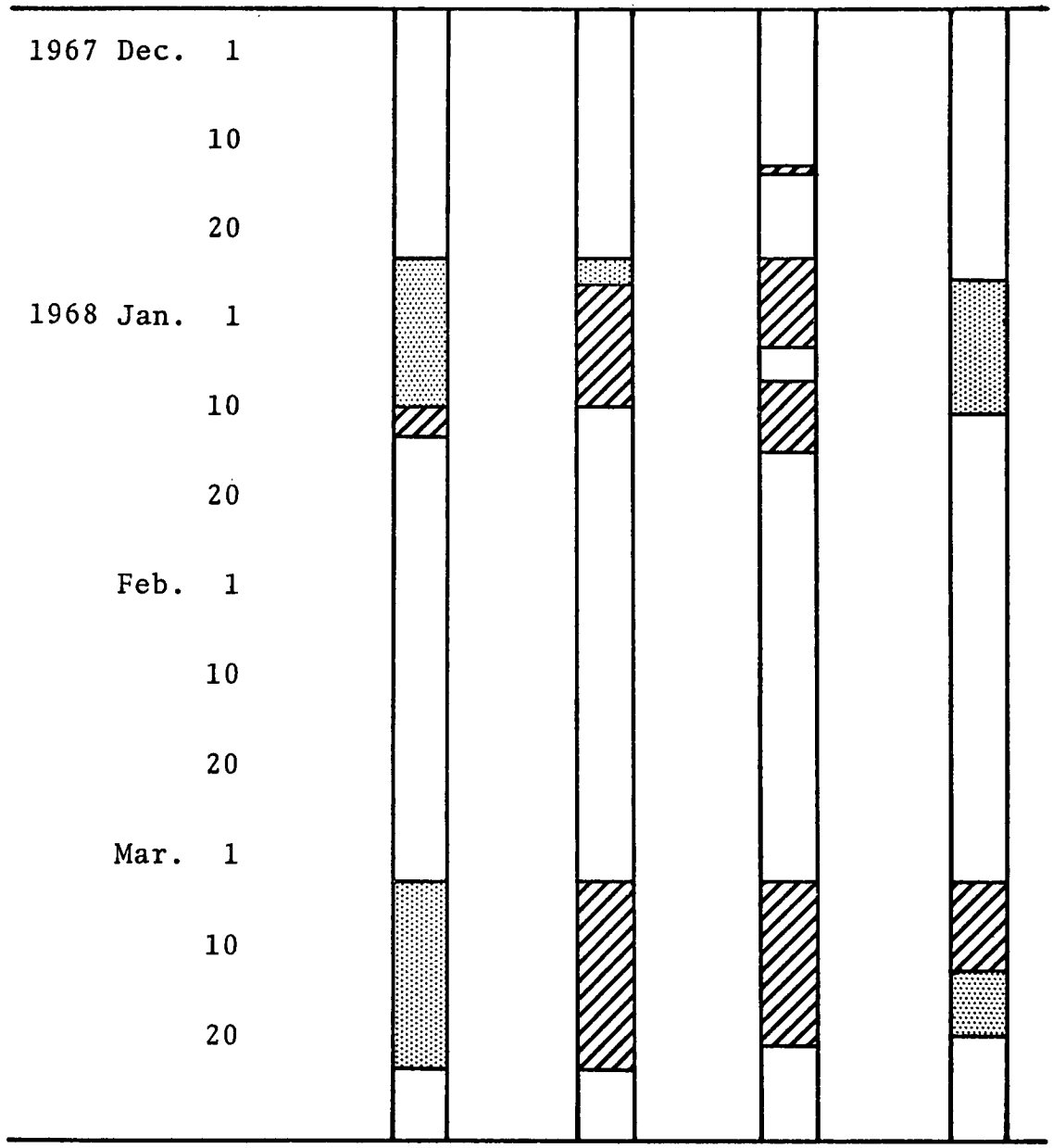
As explained above, almost 100% of the food of the Bushmen of the Central Reserve consists of wild plants and animals. Surface water is rarely to be found in the Kalahari; only after heavy downpours during the rainy season do small pools form for a few days in depressions in the bottoms of the pans and *molapo*. The people use this standing water effectively, making their camps almost without exception near such pools in the rainy season. During that period, their migrations are controlled by water - its presence or absence. The number of days for which they can get water from pans and *molapo* varies from one year to another but is presumed to be between 30 and 60 days. And for the majority of the year they must live without it.

Fig. 12 shows how many days the CK Bushmen could use waterholes in the ≠Kade area during the rainy season of 1967-1968. "W" shows presence of water in a hole. "D" shows utilization of water by the people.

Fig. 12 shows that the ≠Kade pan served water for 39 days and the G//areka pan for 36 days (this group moved in to the pan three days after rain) in a year. In this season, it did not rain for the 54 days from the 9th January to the 2nd March.

At times when surface water is unavailable, the Bushman's main source of water is in vegetable: two species of melons, *Citrullus lanatus* and *C. naudinianus*, two species of tubers, *Rhaphionacme burkei*, and *Coccinia rehmannii*,

Fig. 12 Available Dates of Standing Water



	G/erohonam	G//areka	≠Kade	G/edon!u
Total number of days of W	39	3	0	25
Total number of days of D	3	36	39	10

: W : D

Table 6. Bushman Camps and the Population of Each at a Given Point in Time (20/Dec./1967) in the ≠Kade area

Camp	adult M	adult F	young M	young F	Total
A	11	11	11	9	41
B	5	9	9	8	31
C	2	3	2	2	9
D	5	6	5	2	19
E	4	4	6	6	19
F	3	5	2	3	13
G	11	23	12	11	57
H	2	2	1	3	8
I	2	2	2	1	7
J(estimate)					(50)
K(estimate)					(20)
Total	45	66	50	45	206 (276)

The number and location of the camps is treated in detail in Chapter 4.

and succulents like *Aloe zebrina*, while serving as the Bushman's important food resources, also are prized by him for the water they provide (cf. Fig. 13)

The use of animals as a water source is uncommon. Blood or the juice squeezed from the contents of the stomach can be used for drinking, but animals are not caught very often in the first place.

Fig. 13 shows the seasonal changes in water resources. *Tsama* melon, *Citrullus lanatus* is an excellent source of water It contains more than 90% water and keeps for a surprisingly long time, throughout the year in some cases. At the end of December 1971, I observed a group camping at Kxaochwe, about 30 km. south of ≠Kade pan. They were still living on *tsama* which they had collected with great effort, and at the same time they could come across the first fresh melons of the new season. The two species of plants which possess juicy tubers are not so good as a source of water. They are both fibrous and *Raphionacme burkei* is especially bitter. When *tsama* melon is available, this species is always intensively collected. It is an illustration of extreme selectivity of food plants.

It is difficult to measure the daily amount of water the Bushmen take in when there is no standing water, but during June, July and August there are many days when they eat nothing but the *tsama* melon, so we can measure the quantity of melon eaten and the amount of water contained therein.

One person eats about 5 kg. of melon in a day Reckoning that the part of the melon left after discarding the rind is about 90% water, we can eatimate that the amount of water in the whole melon is about 70% by weight.

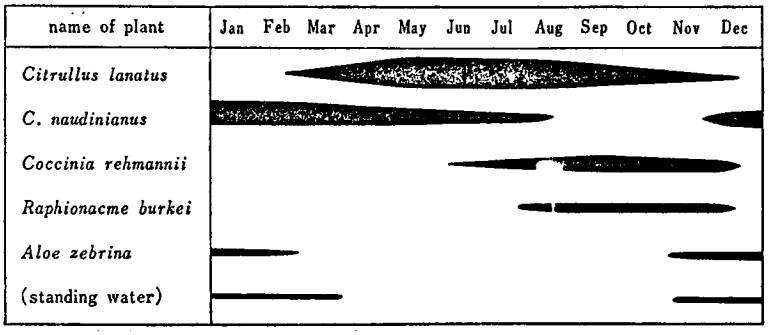
5000 x 0.7 = 3500 (g.)

In other words, it comes to about 3,500 ml. per person per day. In even drier times, when the melons wither, water is obtained by squeezing out roots; the amount consumed at such times, however, is clearly less than the figure arrived at above. In Japan it is said that each person needs at least 2,000 ml. of water a day, but considering that the above-mentioned 3,500 ml. is included in the Bushman's food, it becomes clear that he is scraping by at a minimum level in the arid Kalahari.

9. Plant food

At first glance the Kalahari *bushveld* and woodland seem to be barren, desolate regions, but on closer inspection these are revealed to support a diverse flora which supplies the Bushman with all the nutrition, drugs, and tools he needs in his daily life.

Fig. 13 Seasonal Changes in Principal Water Resources



Of the plants the Bushman considers as his food, the varieties I was able to see myself number in eighty. These food plants are divided into the following five categories on the basis of amount used (see Table 7).

1. Major foods (11 spp.): Those foods each of which, at some time during the year, constitute a majority of consumed food.

2. Minor foods (9 spp.): Less used than major foods, they become the chief foods at times when the major foods are not available and are equally important as them.

3. Supplementary foods (15 spp.): The quantity consumed is small, but these frequently find their way to the dining table and are important for nutritional balance.

4. Rare foods (25 spp.): Supplementary in nature, but such small quantities are gathered and eaten that they are of no real importance.

5. Probable foods (20 spp.): Although the Bushmen claim these as part of their diet, I have never seen anyone eat any of them; they would seem to be of doubtful value as foods.

If I had continued my observations for a longer period, the number of foods included would certainly have been larger than 80. In terms of amount gathered, the major foods are the most numerous, while the major and minor foods combined make up the bulk of the Bushmen's food. The reasons for their dominance in the diet are as follows:

1. They are abundant.
2. They are easy to gather and carry.
3. They taste good.
4. They are nutritious.

The Bushman uses various parts of the plants -leaves, stalks, roots, flowers, seeds - and in different seasons uses different plants; at any time of the year there are enough plants in suitable condition for eating to permit him to choose a good menu. In any given period a couple of dozens of the above plants should be in edible shape, but the Bushman has his favorites and in actuality never uses more than a few foods at the same time. At times when their favorite foods are most abundantly available, for days on end they will gather only one or two species.

Fig. 14 shows the shifts in main foods of the CK Bushmen during one year.

In November, around the start of the rainy season, tubers of *Coccinia rehmannii*, *Rhaphionacme burkei*, and *Cucumis kalahariensis* continue to be

Table 7 Various Species of Plants Eaten by CK Bushmen

	Scientific name	remarks
Major food (11 spp.)		
1.	*Citrullus lanatus*	(melon), water, sugar
2.	*Citrullus naudinianus*	(melon), water, sugar
3.	*Cucumis kalahariensis*	(root), water, starch
4.	*Coccinia rehmannii*	(root), water, starch
5.	*Bauhinia esculenta*	(~~nut~~ bean, root), fat, starch, protein
6.	*Bauhinia macrantha*	(bean), fat, starch, protein
7	*Ochna pulchra*	(berry), fat
8.	*Scilla* sp.	(tuber), starch
9.	*Grewia flava*	(berry), sugar
10.	*Grewia retinervis*	(berry), sugar
11.	*Terfezia* sp.	(~~underground part~~ truffle)
Minor food (9 spp.)		
12.	*Cucumis angria*	(fruit)
13.	*Rhaphionacme burkei*	(root), water
14.	*Scilla* sp.	(tuber), starch
15.	*Aloe zebrina*	(leaf flesh), water
16.	*Ximenia caffra*	(berry), sugar
17.	*Brachystelma* sp.	(root), water
18.	*Strychnos cocculoides*	(fruit)
19.	*Talinum crispatulum*	(leaf, stem)
20.	*Oxygonum alatum*	(leaf, stem)
Supplementary food (15 spp.)		
21.	*Terminalia sericea*	(leaf)
22.	*Scilla* sp.	(tuber)
23.	*Grewia avellana*	(berry)
24	*Ximenia americana*	(berry)
25.	*Strophantus* sp.	(root), water
26.	*Brachystelma* sp.	(root), water, starch
27.	*Brachystelma* sp.	(root), water, starch
28.	*Talinum tenuissimum*	(leaf, stem)
29.	*Vigna longiloba*	(nut)
30.	*Kedrostis foetidissima*	(leaf)

31.	*Corallocarpus bainesii*	(leaf, stem)
32.	*Caralluma Krobelii* *C. lutea*	(stem)
33.	*Huerniopsis decipiens*	(stem)
34.	*Vigna parviflora*	(root)
35.	*Boscia albitrunca*	(leaf, berry)

Rare food (25 spp.)

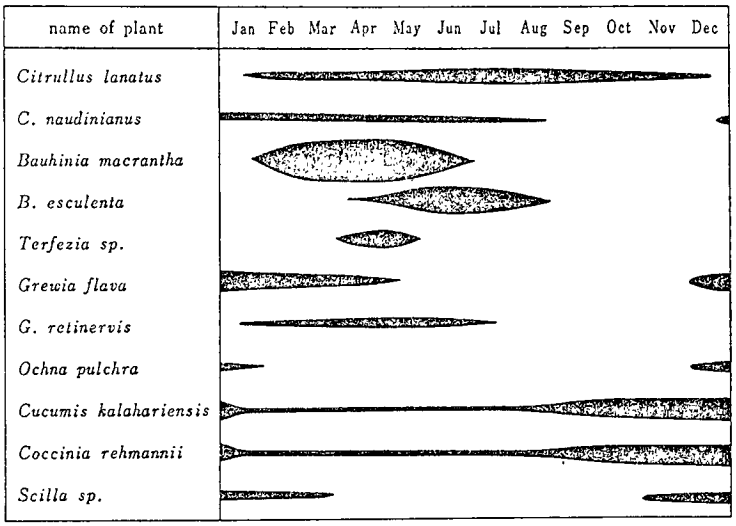
36.	*Grewia flavescens*	(berry), sugar
37	*Ornithogalum amboensis*	(root)
38.	*Commiphora africana*	(root)
39.	*Commiphora angolensis*	(root)
40.	*Commiphora pyrcanthoides*	(root)
41.	*Pergularia daemia*	(leaf, stem)
42.	*Solanum rautanenii*	(leaf, stem)
43.	*Aloe littoralis*	(leaf flesh)
44	? (kannagi)	(root)
45.	*Depcadi marlothii*	(tuber)
46.	*Ziziphus mucronata*	(berry)
47	*Ehretia rigida*	(berry)
48.	*Cephalocroroton puschelii*	(tuber)
49.	*Dipcadi viride*	(tuber)
50.	*Clerodendrum uncinatum*	(berry)
51.	*Eriospermum* sp.	(tuber)
52.	*Eulophia hereroensis*	(root)
53.	*Acacia luederitzii*	(edible gum)
54.	*A. giraffae*	(edible gum)
55.	*A. mellifera*	(edible gum)
56.	*A. erubescens*	(edible gum)
57	*Acacia nebrownii*	(edible gum)
58.	*A. hebeclada*	(edible gum)
59	*A. fleckii*	(edible gum)
60.	*Albizia anthelminthica*	(edible gum)

Probable food (20 spp.)

61.	*Adenia repanda*	?
62.	*Casia biensis*	(root)
63.	*Eriosema cordatum*	(root)
64.	*Tenaris schultzei*	?
65.	? (g//ara)	(tuber, stem)

66.	? (gera)	(root)
67	*Walleria* sp. ?	(root)
68.	? (!kon)	(tuber)
69	? (kyomkyuchu)	(tuber)
70.	? (kuka)	(root)
71.	? (/uru)	(fruit)
72.	*Ceropegia* sp. ?	(root)
73.	*Ceropegia* sp. ?	(root)
74.	? (iyazadam)	(stem)
75.	*Ipomoea* sp. ?	(root)
76.	? (xai)	?
77	? (/in/u)	(tuber)
78.	*Vigna* sp. ?	(root)
79.	*Strychnos pungens*	(fruit)
80.	*Commiphora* sp.	?

Fig. 14 Seasonal Changes in Principal Food Items



dug as they were during the dry season, providing moisture and starch; but leaf and stalk foods like *Scilla* sp. (*kyun*), which buds just before the first rain and *Talinum crispatulum* are added to the diet as fresh vegetables. Finally, when *Ochna pulchra* puts out its first fruit, followed by *Grewia flava*, these two berries replace the tubers as staple food. *Aloe zebrina* comes into use as a source of water.

In December, when *Citrullus naudinianus* melon ripens and begins to provide water, the digging of roots all but ceases. Green vegetables such as *Talinum tenuissimum*, *Oxygonum alatum*, *Scilla* sp. (*kware*), *Caralluma krobelii*, *Huerniopsis decipiens* sprout and sometimes find their way into the diet. This menu continues into late January.

The beans of *Bauhinia macrantha* ripen around the end of January and become the central food item for several months. When surface water pools dry up, *Citrullus naudinianus* and *Aloe zebrina* are still gathered, but when water is available these beans make up nearly the whole of the Bushman's diet. Even though this is the period of greatest abundance of types of food during the whole year, the Bushmen often totally ignore other foods. The *Bauhinia macrantha* bean is rich in protein and fat, and abundant in the area, rendering gathering comparatively easy. Since this bean is tasty, nutritious and very abundant for a long period, it is one of the most important foods for the ≠Kade people together with the two species of melons which serve them as water resources for most of the year, and three species of tubers (*Cucumis kalahariensis*, *Coccinia rehmanii* and *Rhaphionacme burkei*) which are precious food and water resources in the late dry season. The *Bauhinia macrantha* bean is collected and brought to camp together with its pod in spite of the fact that the pod is not edible and accounts for 75% of the whole weight.

The *tsama* melon (*Citrullus lanatus*) ripens slightly later than the other melon (*C. naudinianus*). It serves man and most animals of the Central Kalahari as their main water source until the late dry season. *Tsama* melon looks like water melon but is much smaller in size (about 1 kg. in weight), none of the fruits are sweet and some are even bitter. This melon is eaten effectively and only the peel, about 20% of its weight, is thrown away. Getting water from two kinds of melon, the ≠Kade people collect the *Bauhinia macrantha* bean intensively until May. The bean drys up and its color turns dark brown around April. Soon it drops away to the ground from a burst pod and then it is no longer possible to collect.

When the ≠Kade people miss the *Bauhinia macrantha* bean, they sometimes

made a trip lasting a few days to collect the *Bauhinia esculenta* bean. This plant only grows in an open scrub plain, over 40 kilometers to the north of the ≠Kade pan. The bean is round and about 1.5 cm in diameter. Since it is much bigger than *Bauhinia macrantha*, it is still possible to collect this bean on the ground until the rains start, though many of them are eaten by rodents. The bean contains much more protein and fat than *Bauhinia macrantha*. It dries up a little earlier than the other bean. So the people say "/oi (*Bauhinia esculenta* bean is a better food than n≠an≠te (*Bauhinia macrantha* bean). Frost makes n≠an≠te bitter, but /oi is already dry when the winter comes, so it remains palatable long after". The ≠Kade people prefer the *esculenta* bean to the *macrantha*, but the former grow far from their usual campsites and the place has very poor vegetation. They cannot find suitable trees for shade for rest during a collecting trip, and they must spend great effort in collecting melons for water and firewood to sustain such a trip.

As both species of *Bauhinia* bean are hard and well preserved, they collect larger quantities than they can consume in one day and store them for the coming difficult season. Since there are limits on how much they can carry on their migrations, they only save about 5 kg. or so; still, this and the rare storage of dry meat[3] are remarkable as examples of food storage among the Bushmen.

In April and May, another excellent food plant, the truffle *Terfezia* sp., is introduced into the menu. It is uncertain whether this species is a root parasite or fungus. In size and shape it resembles the potato and the texture is like that of soft cheese. It grows just below the surface and has no leaves, stem, roots, or any other visible appendages. It is located by cracks in the ground which the truffle causes as it grows. But its growth depends on rainfall and it is not seen in a drought year.

After June, the *Bauhinia macrantha* bean and the truffle disappear and *Citrullus naudinianus* melon decreases. Only the *tsama* melon remains continuously as a staple food and tubers enter into the main part of their food life. However, because *tsama* melon guarantees their water supply in this early dry season, only the favorite tubers such as *Cucumis kalahariensis* and *Coccinia rehmannii* are selectively collected. It is, however, not so easy to dig these tubers because it necessitates digging in hard sand approximately 70 cm. beneath the surface to get a single tuber.

September and October are the most difficult months. All the trees and grasses wither away and every part of the Kalahari becomes brown and

resembles a barren land. The ≠Kade people are obliged to live the hardest life in a year. Apart from game meat which cannot be relied on, they have to spend a great amount of time and effort in collecting melons, which are very scarce at this time because most of them are rotten or have been eaten by herviborous animals, and in digging up every kind of root. The biggest water resource in this season is the tuber of *Rhapionacme burkei*. Although it tastes very bitter, the ≠Kade people are able to use this plant as a source of water because this species is very abundant and its distribution very widespread. *Strophanthus* sp. and *Brachystelma* sp. produce delicious tubers, but they are not widely distributed in the area and hence of much less importance. Even a bitter tasting plant such as *Dipcadi viride* which would never be touched in other seasons is collected and taken as juice mixed with the other plants. The most important food plants in this season are therefore *Rhaphionacme burkei, Cucumis kalahariensis* and *Coccinia rehmannii*. The arduous life of digging roots is continued until the next rains start and the new food plants become obtainable.

In short, it is the major and minor foods that dominate the menu; from the standpoint of quantity, all lesser foods are negligible. Of the major and minor foods, only the eleven given in Fig. 14 are really important to the Bushman's survival, some number of these being chosen depending on which plants are in season. Most of the Bushman's calories come from these eleven foods, while another few dozen plants figure in his diet as providers of vitamins and minerals or as supplementary sources of water and calories.

Now let us consider which are the really important calorie sources in the Bushman's diet, excluding the species which consist of water or indigestible substances in most of the edible part or which are collected comparatively little, from the 11 species. Analysis of the nutrient composition of the principal food items has been made by A.S. Wehmeyer and is shown in Table 11, page 44a.

The two species of melons consist mostly of water, though they are taken as food too. Two species of *Grewia* berries consist of indigestible seeds in the most part. *Scilla* sp. is a very fibrous bulk and probably not digested to any significant degree. *Ochna* berry is rich in protein and fat but not much eaten and is available for a short period only. The truffle is also consists mostly of water and growth of this species depends extremely on rainfall and its availability is uncertain.

We still have four species of plants as important ≠Kade people's food. They are two species of tubers (*Cucumis kalahariensis* and *Coccinia rehmannii*)

and two species of *Bauhinia* bean. The importance of the former is not only that they constitute the main food in the late dry season, but also that they are utilized by the people throughout the year. And the two *Bauhinia* beans are extremely nutritious and satisfactory to the people, although they cease to be the main food in the mid-dry season. Thus it can be said that the basis of the ≠Kade Bushman subsistence is primarily the tubers of *Cucumis kalahariensis* and *Coccinia rehmannii* and secondarily the seasonal concentration of beans of two *Bauhinia* species.

To know how much food the ≠Kade people eat in a day is difficult, because the quantity differs from one day to another and their eating times are not fixed. Table 8 shows the average weight of food plants taken in a day from a few observations which were made when more than 90% of the diet in a day was provided by a single food plant. It shows, for example, how many kilograms were eaten in a day when only a single species of *tsama* melon was taken in that day. One family means a mean size of the ≠Kade ~~San~~ Bushman families: 1 man + 1 woman + 3 children. It is also difficult to estimate how much should be regarded strictly as food, because the requisite water is taken together with the calorie intake. It is probably not far from the truth, if we estimate as around 600 to 1,000 grams per person per day as the weight of food ingested, excluding melons and truffle which contain 70 to 90% of water.

10. Strategy of gathering

As shown in Fig. 14, the food plants which are abundant, easy to collect and carry, tasty and nutritious, that is to say, "desirable food" are intensively utilized whenever they are in an edible state. Those are *Citrullus lanatus*, *Bauhinia macrantha*, *Ochna pulchra*, *Grewia flava*, *Grewia retinervis*, and *Terfezia* sp. The plants which require great effort to collect, such as *Cucumis kalahariensis* and *Coccinia rehmannii*, the plant which has to be carried long distances back to the camp (*Bauhinia esculenta*), and the plants which are bitter, unpalatable or fibrous, such as *Rhaphionacme burkei*, *Aloe zebrina* and *Scilla* sp. are not much utilized when the other desirable foods are available. *Citrullus naudinianus* melon is very important, but *tsama* melon is preferred when both are available at the same time.

A range within which the ≠Kade people utilize in food gathering activity is within a circle of about 5 km. in radius, centering around the campsite. The people shift their campsite when they consume the food plants

Table 8 Amount of Food Eaten by CK Bushmen in One Day

name of plant	per family	per person
Citrullus lanatus (moisture)	20 kg	4 kg
C. naudinianus (moisture)	25	5
Bauhinia macrantha (protein, fat)	5	1
Ochna pulchra (protein, fat)	4	0.8
Cucumis kalahariensis (carbohydrate)	3	0.6
Coccinia rehmannii (carbohydrate)	3	0.6
Terfezia sp. (probably carbohydrate)	15	3
Scilla sp. (carbohydrate with fiber)	3	0.6

within the range (see Fig. 15). Women usually go out for gathering excursion in a group, while men's hunting is done singly. Since the women, of course, begin to gather food near the campsite, they can complete their routine work by one to two kilometers trip during the first several days of their stay. Then gradually they must go further as they consume the plants near by the camp. If the round trip for gathering food plants comes to exceed 10 km. or so, it is rather convenient for them to move themselves with all their belongings to the virgin country where food plants are abundant.

The most remarkable example, concerning the relationship between the desirable food and the distance from a campsite, is the case of *Bauhinia esculenta* bean. When the *B. macrantha* bean is abundantly available, they have no reason at all why they should have difficulty in traveling more than 40 km. from the usual camping area for the search of the *B. esculenta* bean.

Seasonal changes of the principal food items shown in Fig. 13 and 14 are merely examples in certain year. Available plants and their available months might differ from year to another. It may be given as a conclusion that the tubers such as *Cucumis kalahariensis* and *Coccinia rehmannii* are the most resistant to dryness and so the most stable, and that the CK Bushmen's diet is based first of all on the tubers, with an intention for the "desirable food" which is represented by an intensive seasonal reliance on the nutritious *Bauhinia* beans. The pattern of gathering activity in the CK Bushmen is prescribed by the above-mentioned nature of food plants.

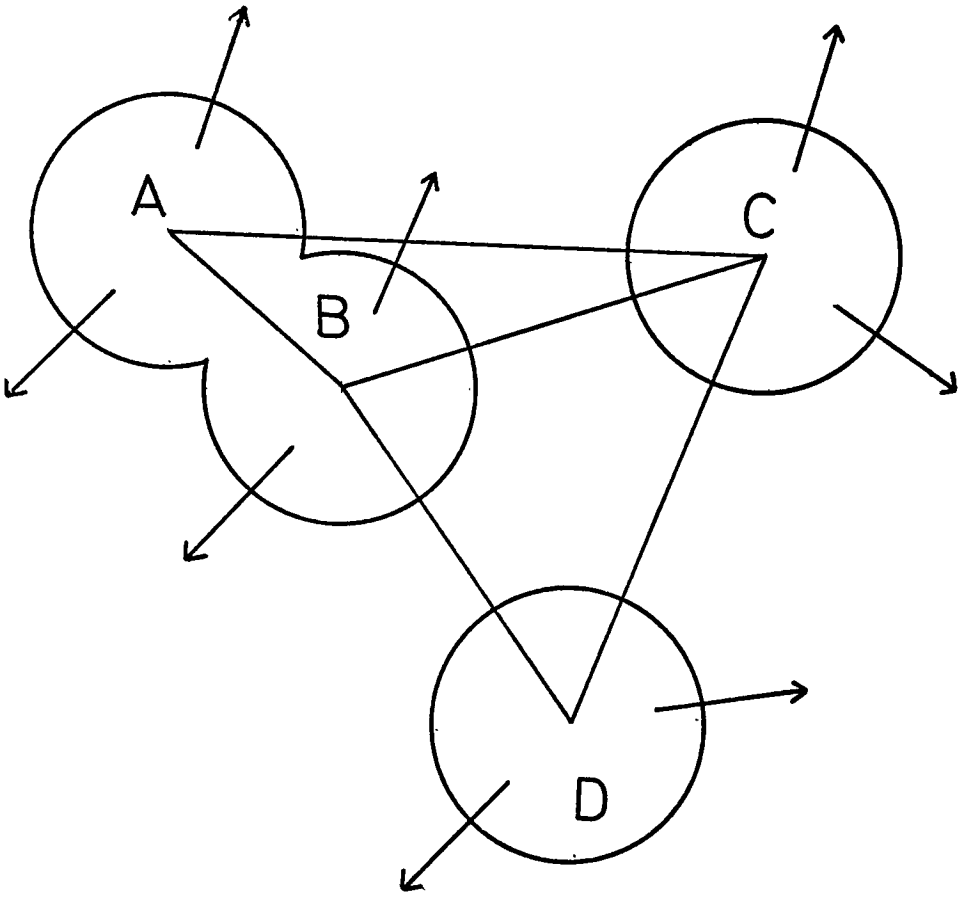
11. Animal food

The CK Bushmen hunt or gather some fifty kinds of animals, including 33 mammals, 7 reptiles, 1 amphibian, several birds, and arthropods (cf. Table 9)

Large game weighing from 100 to 300 kg. includes eland, kudu, gemsbok, hartebeest, wildebeest, springbok, and ostrich, while a giraffe may weigh 1,300 kg. One of any of these should be sufficient to satisfy the appetites of whole camp. Smaller game in the 10-15 kg. range, such as the duiker, steenbok, warthog, jackal, fox, genet, and bustard will probably be distributed among just a few families. Still smaller birds, hares, springhares, porcupines, guinea fowl and the like, weighing only 2-3 kg., are usually consumed within a single family.

The estimated numbers of animals killed and eaten by the CK Bushmen in a year are as shown in Table 10. Bushman camps are constantly changing in location and in composition of membership, so that strictly speaking, it is

Fig. 15 Intensive Utilization of Land



≠Kade Bushmen actually use small area, circles with 5 km. in radius centering around the campsites, A, B, C, etc. Occasional huntig is done beyond that distance.

Table 9 Various Animal Species Utilized as Food by CK Bushmen

	Scientific name	Common name
Class	*Mammalia*	
1.	*Panthera leo*	lion
2.	*Acinonyx jubatus*	cheetah
3.	*Panthera pardus*	leopard
4.	*Canis mesomelas*	black backed jackal
5.	*Otocyon megalotis*	bat eared fox
6.	*Vulpes chama*	Cape fox
7.	*Hyaena brunnea*	brown hyaena
8.	*Hyaena hyaena*	striped hyaena
9.	*Felis caracal*	caracal
10.	*Genetta genetta*	genet
11.	*Felis libyca*	wild cat
12.	*Felis serval*	serval
13.	*Proteles cristatus*	aardwolf
14.	*Herpestes sanguineus*	slender mongoose
15.	*Pedetes capensis*	springhare
16.	*Manis temincki*	Cape pangolin
17	*Mellivora capensis*	honey badger
18.	*Orycteropus afer*	antbear
19.	*Aonyx capensis*	clawless otter
20.	*Paraxerus cepapi*	bush squirrel
21.	*Lepus capensis*	Cape hare
22.	*Lepus saxatilis*	porcupine
23.	*Hystrix africae australis*	porcupine
24.	*Phacochoerus aethiopicus*	warthog
25.	*Giraffa camelopardalis*	giraffe
26.	*Gorgon taurinus*	wildebeest
27.	*Alcelaphus caama*	hartebeest
28.	*Oryx gazella*	gemsbok
29.	*Taurotragus oryx*	eland
30.	*Strepsiceros strepsiceros*	kudu
31.	*Antidorcas marsupialis*	springbok
32.	*Sylvicapra grimmia*	duiker
33.	*Raphicerus campestris*	steenbok

Class *Reptilia*

34	*Python sebae*	common african python
35.	*Typhlops* sp.	blind snake
36.	*Dendroaspis polylepis polylepis*	black mamba
37.	*Bitis arietans arietans*	african puff-adder
38.	Unidentified	giant lizard
39.	Unidentified	leopard tortoise
40.	Unidentified	tortoise

Class *Amphibia*

41.	Unidentified	toad

Class *Aves*

42.	*Struthio camelus*	ostrich
43.	*Numida meleagris*	guinea fowl
44	*Afrotis afra*	black korhaan
45.	*Lissotis melanogaster*	black bellied korhaan
46.	*Ardeotis kori*	kori bustard
47	*Francolinus levaillantoides*	francolin
48.	*Lophoceros flavirostris*	yellow billed hornbill

Table 10 Number of Animals Caught by CK Bushmen

(per Year per 50 Persons)

	average weight of matured animals	estimated number of animals, yearly	estimate of total weight of animals
giraffe	1,000kg	0.25	250kg
eland	300	4	1,200
kudu	300	3	900
gemsbok	200	10	2,000
hartebeest	200	0.5	100
wildebeest	200	1	200
springbok	50	3	150
duiker	15	10	150
steinbok	10	36	360
warthog	16	0.5	8
leopard	20	0.5	10
cheetah	20	0.5	10
black-backed jackal	4	6	24
bat-eared fox	2	14	28
cape fox	2	1	2
genet	1	2	2
porcupine	2	2	4
springhare	1	50	50
hare	1	2	2
ostrich	20	3	60
kori bustard	6	12	72
gunea fawl	0.5	2	1
korhaan	0.4	5	2
rock python	7	3	21
Total			5,606

impossible to express a ratio of animals killed to population; still, Table 10 gives a general idea of the number of each animal taken by a hypothetical average camp of fifty people, based on my successive observations in a number of camps. Small animals such as birds and insects, not included in the table, could be added in but represent a negligible amount by weight. As shown in the table, a group of fifty Bushmen kill aroung 5,600 kg. of game in a year. That comes to about 112 kg. per person, or 0.30 kg. per person per day.

The Central Kalahari Bushmen have many taboos about eating animsls. In general the taboos are determined by one's sex, age, and marital status, but there are also many individual taboos. It is believed that he who eats a taboo animal will meet with sickness or disaster and die. Nobody would ever eat a wild dog, vulture or other animal believed to feed on human corpses. A lion and hyena are generally shunned for the stated reason that they eat people, but certain elderly people may eat them. This taboo does not extend to other carnivores such as leopards, cheetahs, jackals, and foxes.

The most notable animals which bear taboos relating to factors like sex and age are the steenbok, springhare, and small tortoise. The one feared by the most people is the tortoise: no one but infants and aged people can eat it. The taboo on steenbok and springhare affects men and women from about the age of ten to their mid-twenties, dissolving once they have married and their first child is around three years old. The taboo on these two animals also relates to the Bushman's religious views. The trance-like state that may arise during dancing is felt to be connected with the sickness and disasters brought by an evil spirit (G//wama), and people who fall into such a trance while dancing may not eat these meats.

The reasons behind age-determined taboos are not clear, but there is no one possible ecological interpretation. Although Table 10 shows that the steenbok and springhare are the most frequently caught game, both are small animals and can feed only a small number of mouths. Hence, is it not likely that the taboo answers a sociological consideration by barring the healthy young people in their teens and twenties from eating them and distributing the meat preferentially among the very young and very old? Since the meat of one tortoise is so scant as to defy distribution, its eating is restricted to young and old as in the case of the steenbok and springhare.

There are taboos on various animals that apply only to certain

individuals, e.g. some person must not eat the meat of a male hartebeest, another must not eat the meat of a male wildebeest, etc. These taboos seem to have come from the religious attitudes of the Kgalagadi tribe.

The eyes and heart of animals hunted with bow and arrow are usually taboo for women, as are the forelegs of snared animals; if a woman should partake of any of these items, it is believed that her man's hunting will meet with failure.

12. Vegetable food versus Animal food

The ≠Kade Bushmen do not raise either plants or animals for food (the sole domesticated animal, the dog, is not eaten), obtaining all of their food through hunting and gathering; division of labor generally assigns the former to the men and the latter to the women. Women leave hunting by bow and arrow, spear, snare and springhare pole to the men without exception, but the killing of birds and small mammals with a club and the collecting of tortoises and insects is seen as a facet of gathering activity and may be done by the women. The task of gathering falls predominately to the women, although the men also do a sizeable amount. The men often pick and eat plants on their hunting rounds, especially liking to wet their whistles on *tsama* melons. In periods when hunting is poor, the men may go out gathering full-time. When their favorites *Bauhinia macrantha* and *Terfezia* sp. are in season, the men will often ignore the hunting prospects and devote themselves to gathering along with the women. Also, the men frequently bring back plants that catch their eye on their return from hunting, although the amount is tiny compared with the women's harvest.

In comparing the relative amounts of plant and animal food in the Bushman's diet, it will be remembered that the daily amount of plant food per person is about 1 kg., as indicated in Table 8. Consumption of water-rich melons would be more like to 4-5 kg. a day. The total weight of *Bauhinia macrantha* brought back to camp in a day is around 5 kg. per person, but 80% of that is pods, leaving about 1 kg. of edible beans. The daily diet often features any number of melons, leaves, fruits, nuts, etc., but a very rough daily figure would be 1 kg. per person. Assuming a 20% discard rate, the actual amount of food eaten would then be around 800 grams.

On the other hand, ingested animal food has been estimated as 300 g. per person per day. Figuring a discard rate of about one-third for

bones, horns, hooves, contents of the digestive tract, lost blood, etc:

300 (g.) x $^{2}/_{3}$ = 200 (g.)

This calculation shows a daily intake of 200 g. of meat as against 800 g. of plants. That is, the amount of meat is only 20% of the total amount of food. We have deducted from this reckoning a part of the weight of those plants which mainly provide water; if we include such plants as *Citrullus lanatus, C. naudinianus, Rhaphionacme burkei, Coccinia rehmannii,* and *Aloe* sp., the amount of plant food consumed is far more than the amount of meat. That is, the weight of plants including the water content is about five times 800 g., making the ratio of plant to meat 100 to 5.

In short, the diet of the CK Bushmen is overwhelmingly vegetable, with animal food playing an extremely minor role. The reasons for the dominant place of plants are the relative scarcity of game in this region, the primitiveness of the Bushman's bow and arrow, spear, etc., the large amount of practice and labor that goes into hunting, and the relatively scant returns. Hunting is a high-risk endeavor, since the quantity of game is scarce and it is impossible to predict when a good-sized animal will turn up. With plants, on the other hand, one can predict when and where each plant will be found, and no trip in search of plant food will be fruitless (or beanless, or something). Moreover, these plants occur in sufficient amounts to guarantee the Bushman his existence.

I emphasized the importance of vegetable foods in the Bushman food life. I will consider on the nutritious value of the plants which form the staple of the CK Bushmen in the next place.

More than 20 species of the important food plants were sent to A. S. Wehmeyer at the National Food Research Institute in Pretoria, Republic of South Africa for nutrition analysis and most of the species have already been analyzed. Table 11 shows the nutrient composition of the most important food plants out of those analyzed.

Both species of beans of the *Bauhinia* which were used in analysis were the dried ones burst from pods. Since these beans are also eaten when they are still green and moist, the heat value of each bean, *macrantha* and *esculenta* is estimated as 200 Cal. and 250 Cal. per 100 g., respectively, in that case.

From the Table 8 and 11, the heat value of the principal food plants per person per day is calculated and shown in Table 12.

To conjecture the heat value of animal foods, on the other hand, I referred the nutrient compositions of various birds and beasts available in

Table 11 Nutrient Composition of Principal Food Plants

	Bauhinia esculenta	*Bauhinia macrantha*	*Citrullus naudinianus*	*Citrullus lanatus*	*Grewia flava* (sun dried flesh)	*Grewia retinervis* (sun dried flesh)	*Terfezia sp.* (raw)	*Terfezia sp.* (dried)	*Cucumis kalahariensis*	*Raphionacme burkei*	*Coccinia Rehmannii*	
Moisture	5.2	6.8	90.6	97.9	7.2	6.9	85.7	5.7	88.7	91.2	90.7	g/100g
Ash	2.9	3.4	0.7	0.5	3.1	2.4	0.9	8.2	0.4	0.7	1.0	
Fat	36.1	18.1	0.04	0.02	0.2	0.3	3.3	17.0	0.2	0.1	0.1	
Protein	31.6	25.2	1.3	0.1	4.6	4.2	2.5	24.6	1.1	0.5	0.3	
Fiber	1.0	11.1	1.2	0.6	2.8	18.7	2.4	10.4	0.7	1.5	2.0	
Carbohydrate (by difference)	23.2	35	6.16	0.9	82.1	67.5	5.2	34.1	8.9	6.0	5.9	
Calorific value	544	425	30	4	349	290	60	388	54	27	26	cal
Calcium	136	144	39.0	18.3	187	137	11.0	40.1	20.2	136.0	408	mg/100g
Magnesium	258	188	19.7	9.1	121	166	14.0	101	19.7	73.8	67.9	
Iron	3.3	3.82	0.81	0.19	2.87	2.86	12.5	12.6	0.37	0.45	0.67	
Copper	1.0	0.93	0.11	0.06	0.32	0.25	0.4	1.05	0.08	0.16	0.06	
Zinc	3.8	1.9	0.27	0.64	5.38	0.2	3.06					
Sodium	89	1.55	0.69	0.72	3.60	4.48	2.9	17.5	0.97	1.05	2.60	
Potassium	849	861	249	68.6	868	853	548	1,886	77.8	121	175	
Phosphorus	484	334	30	—	102	54	167	589	340	44	—	
Thiamin	0.94		0.918	0.02	0.073	tr.	0.08	0.025	tr.	0.003	0 02	
Riboflavin	0.82	0.205	0.336	0.003	0.364	0.433	0 11	1.74	tr.	0.01	0 01	
Nicotinic acid	1.86	1.245	0.908	0.05	0.905	1.305	0.61	24.74	tr.	0.07	0 26	
Vitamin C	2.68	—	42.4	3.8	—	—	1.5	—	1.6	10.7	5 2	

Table 12 Calorie Intake per Day per Person

plants	remarks	one day's (kg) consumption per person	calory (cal)
Citrullus naudinianus	moisture (carbo-hydrate)	5	1,500
Bauhinia macrantha	fat, protein (carbo-hydrate)	1	2,000(推定) (estimate)
Cucumis kalahariensis	moisture (carbo-hydrate)	0.6	324
Terfezia sp.	moisture (carbo-hydrate)	3	1,800

Table 13 Nutrient Composition of Animal Foods

	cattle round	cattle plate	horse	pig ham	pig belly	wild boar	goat	hare	pheasant	spparrow with bone	chicken	turtle dove		*
Moisture	71.6	60.9	73.6	59.2	42.9	74.1	74.2	74.3	70.4	72.5	72.1	74.3		70
Ash	1.0	0.9	1.2	1.0	0.7	0.8	1.3	1.0	1.6	3.5	1.3	1.2		1.0
Fat	6.1	20.5	3.7	22.9	44.3	8.3	3.8	7.8	2.7	4.6	1.7	1.5	g/100g	10
Protein	21.0	17.5	20.5	16.7	12.0	16.8	20.6	16.9	25.3	19.4	24.9	23.0		20
Fiber	0	0	0	0	0	0	0	0	0	0	0	0		0
Carbohydrate	0.3	0.2	1.0	0.2	0.1	1	0.1	1	1	1	1	1		0.3
Calorific value	146	260	125	279	451	147	123	143	132	124	135	112		150

* Figures in this column are tentatively put for estimate of animals eaten by the CK Bushmen.

Japan. Table 13 shows the nutrient composition of the closely related animals to the Bushman's game. As shown in Table 10, the game animals of the Bushman consist of mainly even-toed ungulates. Wild animals are supposed to be less fatty and to have less heat value than the domesticated animals such as cow and pig, and therefore the mean heat value per 100 g. of each animal appeared in Table 10 is tentatively estimated as 150 Cal.: the heat value of 200 g. meat for a person per day is calculated as 300 Cal. Table 12 shows too little examples about a vegetable food, but we can estimate that a Bushman takes 1,500 - 2,000 Cal. by plants in a day. In total, a Bushman take 1,800 - 2,300 Cal., about 2,000 Cal. on an average, of heat value by one day's food.

To know basal metabolic requirements and the daily caloric requirements of the Bushmen, I refer the figures which Lee used in 1968a.

> The Bushmen are small in stature and weight. Basal metabolic requirements for individuals of such heights and weights are calculated at 1,400 Cal. per day for males and 1,100 Cal. per day for females (Taylor and Pye 1966). Given an activity regime that varies from light-moderate to severe exercise, the caloric requirements can be estimated at 2,250 Cal. for males and 1,750 Cal. for females, per day of an average work week. These figures apply to adults thirty years of age and would necessarily be less for middle-aged and elderly persons. For children I have taken a median age of eight years for all individusls under age fifteen and estimate the daily requirements at 2,000 Cal. (Taylor and Pye 1966).

To calculate the daily caloric requirement for the study group as a whole, it is necessary to take an average weight according to the percentage of each age-sex class in the population. Since the population consists of 22 per cent adult males, 32 per cent adult females, and 46 per cent children under fifteen years, the mean energy requirement for a group of one hundred persons is 197,500 Cal. (2250 x 22 + 1750 x 32 + 2000 x 46), and for each group member, about 1,975 Cal.

The per capita yield of foodstuffs during the study period was estimated to be about 2,000 Cal. and therefore the CK Bushmen are taking a sufficient energy from a daily food intake. The conclusion can be drawn that the Bushmen do not lead a standard existence on the edge of starvation as has been commonly supposed. Yet a ratio of the heat value of vegetable food to animal food is 5.7 : 1 and it can be said that vegetables are by far the better food than animals as a calorie source.

Well then what exactly is the importance of meat in the Bushman's diet? Obviously it plays a major supplementary role, forming close to 20% of his diet, but besides this quantitative importance, meat also has great qualitative importance. The Bushman himself considers meat the most admirable of foods, so much so that he says meat is "the true food"; his estimation of it is even higher due to its scarcity

13. Labor

From the age of seven or eight, the Bushman chidren begin to learn to get food they pick fruit, dig roots, and, in the case of boys, shoot at small birds with bow and arrow; this is mainly done for play, but at the same time serves as training in the life skills they will need when older. The training needed to become a hunter is much greater than that needed to learn to gather plants, and a boy takes much longer to become a full-fledged hunter than a girl takes to become a first-rank gatherer. Probably related to this is the fact that the marriageable age for woman is the highteen or the early twenties but the late twenties for men.

Until they get married and set up their own lives independent of their parents, both men and women take a half-hearted approach to food procurement, relying on their parents' efforts. The aged and infirm who are unable to get food for themselves must naturally depend on close relatives for their sustenance, but in a mobile society like that of the CK Bushmen, people who cannot get around will probably not last long. During my investigation in the ≠Kade area, I did not see a single sick or aged person who could not move around freely. There were two oldsters who were clearly over seventy[4], and another handful who seemed to be over sixty, yet all were healthy, and even the men who were unable to hunt would go out gathering nearly every day and were capable of supporting themselves.

We can distinguish, among the Bushman labor force, between the "providers", who conduct food-procuring activities regularly, and the "dependents", who are everyone else. In the ≠Kade area there are 125 "providers", which is 57% of the total population of 221. Further, of the people I observed throughout the entire Reserve, 169 of 318, or 53%, were "providers" (cf. Table 14).

As one criterion for the amount of labor performed by the "providers", we can measure the time they spend out hunting and gathering. Table 15 shows the time spent getting food by the sixteen "providers" of the !Koi!kom camp for the ten-days period from October 4 through 13, 1967. The reason

Table 14. Number of Bushmen Confirmed as Living within the Central Reserve (9/67-8/72)

area	Provider male	Provider female	Provider total	Dependent male	Dependent female	Dependent total	Total
≠Kade	57	68	125	47	49	96	221
Menoatse	9	13	22	11	13	24	46
!Aoha	5	6	11	4	9	13	24
Masane	1	1	2	0	3	3	5
Metse a Manong	2	7	9	6	3	9	18
Total	74	95	169	68	77	145	318

Table 15. The Bushmen's Working Hours

(Time spent out of camp searching for food, Oct. 4-13, 1967)

	Name	Sex	4	5	6	7	8	9	10	11	12	13	Total	Daily avg.
1	Orekua	M	4.00	7.00	9.00	10.00	9.15	7.30	11.00	5.30	10.10	-	73.25	7.20
2	Shoeka	"	4.00	-	-	10.30	1.00	8.30	10.30	-	10.10	-	44.40	4.30
3	/Ug≠ama	"	4.00	7.00	9.00	7.00	1.00	9.00	11.00	9.50	10.10	-	68.00	6.50
4	Ayakxoi	"	-	-	-	3.00	-	9.00	-	-	-	-	12.00	1.10
5	!Kana	"	9.00	8.30	9.40	11.20	10.00	9.00	10.45	7.30	10.10	4.00	89.55	9.00
6	N/araji	"	4.00	8.30	10.00	7.40	10.30	9.00	11.00	12.00	12.10	11.00	95.50	9.35
7	!Kawamakue	"	-	12.00	5.00	12.00	12.00	6.20	9.45	12.30	10.10	-	79.45	8.00
8	Kenen/u	"	-	2.00	4.00	8.10	2.00	3.30	-	12.30	10.10	-	42.20	4.15
Men's Total			25.00	45.00	46.40	69.40	45.45	61.50	64.00	59.50	73.10	15.00	505.55	50.35
9	N//aeba	F	-	5.00	5.30	10.00	1.00	6.00	2.10	4.35	1.35	-	35.50	3.35
10	!Kae!Kakyue	"	-	5.00	5.30	10.00	-	6.00	2.10	3.35	4.05	-	36.20	3.40
11	!Kotsepe	"	-	-	5.30	10.00	-	6.00	-	4.35	1.35	-	27.40	2.45
12	Doba	"	-	5.00	5.30	10.00	1.00	6.00	2.10	4.35	1.35	-	35.50	3.35
13	!Kaekan/u	"	-	5.00	-	10.00	1.00	-	-	-	-	-	16.00	1.35
14	Kaboko	"	-	-	9.00	10.00	1.00	-	-	3.05	-	-	23.05	2.20
15	/Ea!kahon/ubi	"	-	8.30	9.00	10.00	-	6.00	2.10	4.35	4.05	-	44.20	4.25
16	Shie!Kaho	"	-	-	-	8.00	-	6.00	-	4.35	-	-	18.35	1.50
Women's Total			-	28.30	40.00	78.00	4.00	36.00	8.40	29.35	12.55	-	237.40	23.45
Grand Total			25.00	73.30	86.40	147.40	49.45	97.50	72.40	89.25	86.05	15.00	743.35	74.20

that the total for the men on Oct. 12 is so great is that all the men except N/araji and Ayakxoi went off in pursuit of a gemsbok that /Ug≠ama had shot the day before. The women, almost certain of having meat that night, spent little time out gathering. The next day, the 13th, as there was still some meat left over, hardly anyone left camp. At this time the main food was the root *Cucumis kalahariensis*, and the reason that the women spent so little time in the field on the 8th was that they had put in long hours the day before and still had plenty of food left.

The table clearly shows that the men are out much longer than the women, and also that there is great variation from person to person. For example, Kenen/u and his wife Shie!kaho were still young and childless and had no family to support, so neither of them had to spend much time procuring food; and Ayakxoi had hurt his foot and could not go hunting, so his time out was far less than the others. The total time in the field for the sixteen "providers" in the ten-day period was 743 hours and 35 minutes. The daily average per person was:

743 hrs. 35 min. x $^{1}/_{10}$ (days) x $^{1}/_{16}$ (persons) = 4 hrs. 39 mins.
(There were 14 dependents.)

Of course, there is much individual variation, and the time spent depends also on the type of plant gathered and the method of hunting used and also varies from season to season. Including data from other camps at other times of the year, however, we can conclude that the women go out for from one to five hours almost every day, while the men go out three to five days a week for from five to twelve hours. The average figures correspond more or less with those in Table 15. Since the sun's rays beat down mercilessly on the Kalahari most of the year, the Bushmen often stop to rest in the shade during their day's work; thus the actual time spent working in the field is somewhat less than the figures shown in the table.

But the Bushman's work is not limited to hunting and gathering: there are also various tasks to be done in camp. The camp chore requiring the most time is food preparation, a job which falls to the women, who spend less time out of camp. The men, on days when they do not go out hunting, make and repair leather goods and hunting tools. Such work, however, probably takes not more than two hours a day. Among the incessant chatting that takes place whenever a number of people are gathered in camp, there are some subjects that have a direct relationship to the Bushman's daily life, such as the availability and distribution of plants and animals,

decisions pertaining to moving camp, censure and judging of those who have violated social strictures, or a marriage in the family; because such conversations help Bushman society to function smoothly, we might consider them as labor. Most of Bushman conversation, however, consists rather of rumors, slandering, jokes and other such light and amusing matter, so I will simplify things by restricting the term "labor" to physical labor only.

The Bushman's daily work load averages not more than seven hours, which is not especially excessive when compared with the work day in Japan and other advanced countries. On the contrary, considering that the Bushman might be thought to be just barely scraping by in the inhospitable Kalahari, surviving only on wild plants and animals, exposed directly to the harshness of nature, the figure is less than expected.

The Bushmen get around seven hours of sleep at night and also take occasional naps during the day when not out finding food. Besides napping, they loll around alot resting and talking, and spend much time at amusements such as singing, dancing, and playing games.

14. Movement of camp

The Bushman's diet changes in response to seasonal variations in plant growth, but as long as his life is based on gathering food from a limited supply of wild plants, he will not be able to live continuously in one place. As the main food plants change during the year, the Bushman must move from place to place in accordance with the distribution of these plants; even if the main food stays the same, he will have to move if the supply becomes exhausted in a given location.

The Bushman must be intimately acquainted with the flora and fauna of the Kalahari, knowing when and where to find what kind of plant or animal and in what condition. Due to the pattern of rainfall in the Kalahari, distribution of plants is extremely localized, and the growth rate also varies greatly in slightly separated places. Since it is generally true that plants do not grow very densely and that the edible part of the plant is small, a single campsite cannot sustain the Bushmen for very long. The normal period is from one week to a few weeks. The Bushmen must continuously move in search of newly fruiting plants or as the supply around their camp is exhausted. Thus such movement can be looked upon, from the point of view of the Bushmen's daily life, as a group food-procuring activity and as an indispensable element of their hunting and gathering existence. Except in the case of groups like the Indians of the North-

west Coast, whose supply of plant food is superabundant, or the Ainu of Hokkaido, who live by fishing, it is unavoidable that hunters and gatherers will, to some extent, have to change their residence in search of food.

The timing and destination of a move by the CK Bushmen are almost 100% determined by vegetable food; hunting conditions and distribution of game hardly figure at all in such decisions. This is easy to understand in terms of the predominant role of plants in their diet. Moreover, animals, the objects of the hunt, are extremely mobile, and it would be nearly impossible to move along with them. Only during the rainy season, when water accumulates in the pans and *molapo*, do water holes replace plant food as determinants of camp location. This represents, however, merely about three months out of the year (January-March; cf. Fig. 12).

According to Lee, the northern !Kung base their movements on water holes which remain filled throughout the year (Lee 1965), but in the Central Reserve where there is no permanent surface water, for most of the year water holes are not a factor.

The Bushmen of the ≠Kade area have a range with a radius of about 50 km. centering on the Okwa and the three *molapo*, where the vegetation is relatively rich and the variety is great; their yearly peregrinations probably take them an average of some 300 km. The total area of their nomadic range is close to 4,000 sq. km. (cf. Fig. 4). Figure 16 traces the movements during the seven months from September 1967 through March 1968 of the family among the ≠Kade Bushmen which moved most frequently (an extended family of seven: husband and wife, three children, husband's parents). This family made eleven different campsites in those seven months and covered about 250 km.

Thus the CK Bushmen move with great frequency and over a large area, but detailed observation reveals definite patterns in the course of their movements. That is, the possible campsites are determined in advance, and the routes they follow from camp to camp are also fixed, to the extent of being footworn. Campsites must always be within the acacia woodlands where firewood and building materials are close at hand, and in a spot where their favorite food plant is abundant. The Bushman knows, from the knowledge and experience of many years, where to find one of the limited number of such "desirable campsites" Although the Bushman journeys among a number of fixed campsites within his range, it is not the case that he follows and annual cycle, moving from camp A to camp B, then on to camp C, and so on; depending on the conditions of growth of food plants, he may

Fig. 16 Movements of One Family Group
(Nuclear Family and Father's Parents, Sept/67-Feb/68)

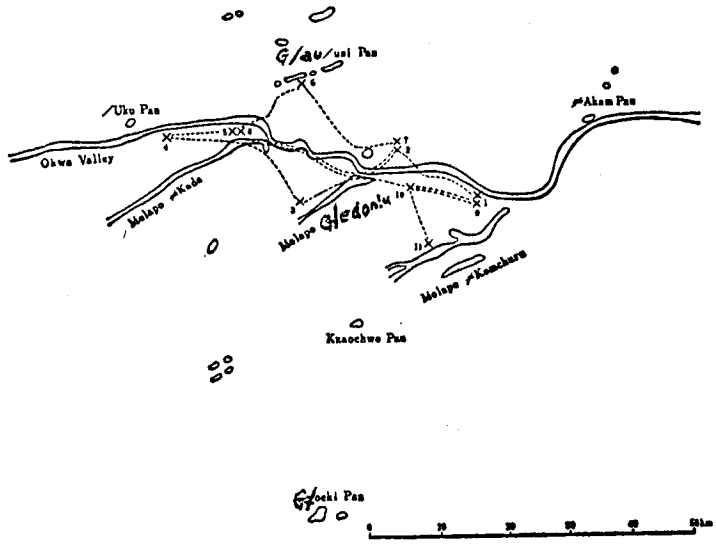
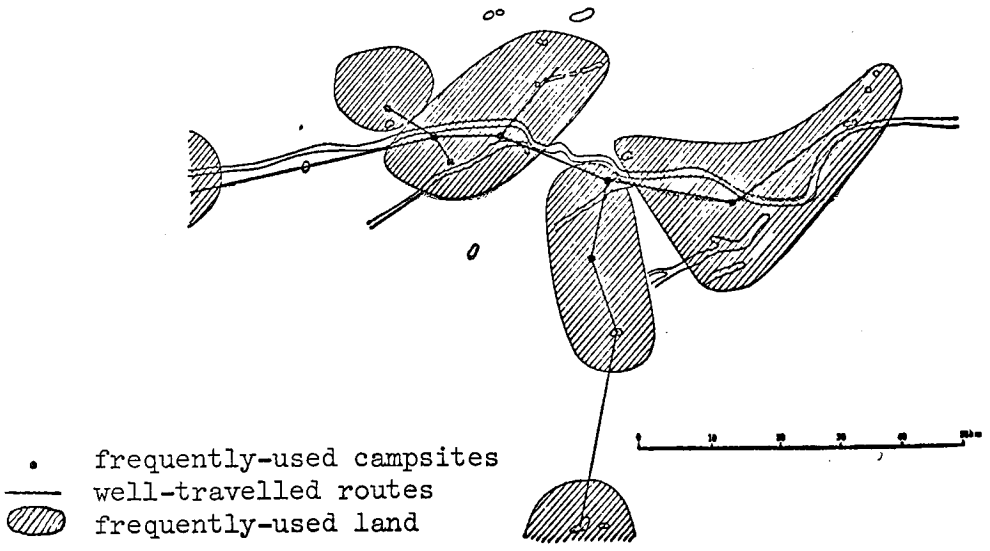


Fig. 17 Movement Patterns and Land Utilization



move from A to C, then to B, then to C and back to B, in an order and with a frequency not predetermined. This is an issue tied in with plant distribution and people's tastes.

The area actually used by the CK Bushmen in their daily life is limited to a plant-gathering area with a radius of about 5 km., with rare journeys beyond that distance in search of big game. Thus, although their range covers a huge area of 4,000 sq. km., the land they actually use probably makes up less than a third of that area. Only a small part of this one third is used intensively for gathering and hunting: the Bushman's use of natural resources, like his selectivity in choice of food, shows great extravagance (cf. Fig. 17).

15. Summary of dietary life and habits

1. Food is abundant and varied. Plant and animal life flourish in the Kalahari *bushveld* to an extent unimaginable when viewed from the outside. I observed 80 plants and more than 50 animals which were used as food.

2. More than 90% of the Bushman's water comes from plants. Surface water is available only on a few days during the rainy season, so for most of the year moisture must be derived from plant and animal sources. Melons and roots supply to bulk of the water.

3. Vegetable food surpasses animal food in terms of both quantity and stability or security, and forms the basis of the Bushman's diet. Meat, besides playing a role as a supplementary food, also is seen as a valuable food because of its deliciousness and its scarcity.

4. Selectivity of food is high. Of the 80 species of food plant, those which are actually frequently used are only the 20 "major" and "minor" foods; there are many edible plants that are in fact hardly ever eaten.

5. The 11 species of principal food plants are especially abundant, guaranteeing the Bushman a food supply throughout the year.

6. Among major foods, the roots *Cucumis kalahariensis* and *Coccinia rehmannii* are important as a stable supply item, being available all through the year; the beans *Bauhinia macrantha* and *B. esculenta* are next in importance.

7. The Bushmen must move camp in response to changes in availability and distribution of plants. In general, such mobility is an indispensable element in a hunting and gathering society

8. Amount of labor is relatively small. The ratio of "providers" to

"dependents" is about one-to-one; the daily work load of the "providers" is less than seven hours. Much time is devoted to rest and leisure.

9. The CK Bushmen's range is large, about 4,000 sq. km., and the population density is low, 0.05 person per square kilometer.

10. Their travels follow a limited number of paths. They utilize less than a third of their range, and only a small part of this sub-part is intensively used.

From all of the above it should be clear that the Bushmen, who have been called a hunting people, actually have an economy based on plant gathering. This is probably true of all hunting and gathering peoples, with the exception of such hunters and fishers as the Eskimos and Indians of the far north, the Ona, Yukaghir and Ainu. Further, we should understand that a hunting and gathering economy, rather than being extremely unstable, actually stands on a solid economic base. To put it another way, a people cannot continue to exist with an unstable economic base, and even a hunting and gathering society can only exist on a stable economic basis. Close relationship of the society with nature makes this particular economic base all the more important.

Notes to Chapter 3

1. Yeast was introduced from the Kgalagadi tribe, but the particulars are not known.
2. The cultivated plant whose stalk is used for the shafts of arrows is thought from its shape to be a sort of millet, but its species name is unknown.
3. Meat is cut into strips 2 cm. thick and hung from a branch of a tree to dry. In this arid land the meat dries in about three days and can then be kept. Not only the Bushmen, but also the Europeans and Bantus in the Kalahari prepare dried meat as a portable food. This specialty of southern Africa is known as *biltong*.
4. Past age thirty the Bushman's body becomes covered with wrinkles and age is difficult to guess. These old people had great-grandchildren, so one can reckon backwards to guess their approximate ages.

Chapter 4 Structure of the Residence Group

1. Introduction

In Chapter 3 I described the diet and food-getting activities of the Central Kalahari Bushmen. There I focused on the question of food, the most important and fundamental matter confronting the Bushman as a living creature seeking to survive, and I tried to paint a picture of his close relationship with and adaptation to nature. The picture painted there was one of the Bushman living in the middle of the particularly uninviting Kalahari and surviving by man's most primitive economic form, hand-to-mouth economy depending on wild plants and animals, and yet by no means barely eking out his living through continuous toiling in search of each day's food; instead, he utilizes the scant resources with skill and evinces a remarkable adaptation to his harsh environment.

He selects his favorite foods from among a wide array of plants and moves camp over a large area, but actually uses only a small portion of the land. He is very extravagant in his use of land, spends strikingly little time laboring and much time at rest and leisure. Moreover, he never worries about the next day's food and seems to be content with a minimally sufficient margin of survival in his life style.

Having dealt with the fundamental question of the Bushman's survival, namely food procurement, we turn now to the question of his social adaptations. If food is a question concerned with the maintenance of the individual, then in this chapter the focus will be on broader questions concerning the maintenance of the group.

2. The nature of the question

Among the Bushmen one cannot speak of lineages, clans, or tribes which unite the whole society: the level of social integration is extremely low. It could be called a band level society

There is no labor specialization other than the sex-based division of hunting and gathering and the like; there is no concept of rank or status, no social class structure. With the exception of the very old and young who cannot survive on their own, all adult males and females participate in the society on an equal footing. Egalitarianism is a general principle permeating Bushman society. Consequently this society has no chief to command it and no full-time specialists. As a rule every individual can accomplish everything necessary for his or her livelihood, and Bushman

society as a whole is a completely self-sufficient unit.

Bushman society has none of the fixed political institutions, such as a legal system or a chiefdom, seen in many of the world's *primitive* societies: social life is conducted on the basis of individual will and conscience. Since the population is only a few hundred, all the members are interconnected by various kin ties, and such ties play an important role in the social structure; yet the kinship system is not very developed.

Well then, how in the world does Bushman society continue to exist as a group? The Bushman has a very poor sense of time: one might even say that if he has enough food for today, if he can sing the praises of sex and enjoy life at the moment, then he is satisfied. They neither dwell long on past events nor worry about the next day's food. They are optimists living only for the present. Bushmen are generally amiable, the possessors of sunny dispositions, continually joking and laughing. And yet they have their descreet aspects, are very flexible and dislike all disputes. Individual's desire to possess is strong and then way of thinking is egocentric, but they regard steeling no good because they have a firm idea of possession. So how does the individual with his egocentric way of thinking manage to exist, embedded in a society grounded in egalitarianism and premissed on sharing and cooperation? Because this society has no clearly systematized social institutions, the manner of resolution of the inevitable contradictions and conflicts between individual and group becomes all the more important.

The Bushmen, due to their food-gathering activities, must shift their campsites constantly The important point here is that during these frequent moves the membership of the groups changes. Bushman residence groups are free and very fluid and of extremely diverse composition; accordingly, the term "band" is not at all appropriate to describe them. This is because the concept of "band" applies to a corporate group which possesses territory as a group and has both leadership and a fixed membership. The Central Kalahari Bushman residence groups, having neither territory nor fixed membership and changing location every few weeks, could most fittingly be called simply "camps", like those of the northern Kalahari !Kung studied by Lee (Lee 1965) and the Hadza of Tanzania investigated by Woodburn (Woodburn 1968b)

The only social unit in Bushman society that endures over many years is the family It would be possible to treat the camp, an agglomeration of several families, as a functional unit in everyday life, but the camp,

as explained above, is fluid group which fragments and realigns very frequently. I believe that it is precisely the fluid structure of these loosely-aligned groups that is the key to the survival of Bushman society

In this chapter, I will first deal with the question of sharing and cooperation and then briefly treat the various systems which function to maintain the group such as kinship, political organization and religious beliefs; with that background I will finally focus on the structure of the group and its social adaptations.

3. Sharing and cooperation

The integrating and governing principles of the egalitarian Bushman society are the principles of sharing and cooperation. Sharing and cooperation transcend the family unit to include all members of a camp and yet are closely linked with the kinship system.

Sharing applies to various items such as food, hunting and gathering tools, household goods, clothing and personal ornaments; among these, food is the most frequently shared and the distribution of that is the most important for the Bushmen, living hand-to-mouth in the rugged Kalahari, sharing of the food they bring back to camp clearly serves as a mutual guarantee of the continued existence of each of them. Food sharing among people living together is so thorough as to seem almost compulsory.

When large game such as a giraffe or large antelope is brought into camp, the meat is, as a rule, distributed among all the people living in the camp. By the method of distribution peculiar to this society, the meat is not immediately distributed equally among the whole camp. When the animal is slain, it is divided into six portions: the four limbs, the head and neck, and the torso; it may be further subdivided depending on the number of men who will carry it back to camp. Back in camp, the first portions are given to the few men who participated in the hunt. Certain people who were not on the hunt may also be included in the first distribution for various reasons, such as having lent to the archer the arrow which killed the animal. The senior male takes charge of the distribution, while the people sitting and standing all around the pile of pieces of meat, visually measuring the shares that should go to each family, shout out directions like: "You should cut a little off that rib meat over there and add it to this pile." There are often arguments about the amount of meat received, but these are usually not angry, rather just expressions of excitement with such a feast lying before their eyes; it might even be

said that they enjoy such arguments. Amidst all the uproar, the man in charge finishes the dividing of the meat with dispatch. The archer always takes the back portion and uses the *Musculi dorsi*, running from the neck down the back, to make various implements. The hide also goes to the archer. Other than the back meat, there are no special claims on particular cuts, although the senior man usually gets the head. Once the meat has been divided among the families, it is further distributed to close relatives, friends, and visitors, to be divided yet again among them, until eventually every individual in camp has a share. Here there is no distinction of haves and have-nots. Actually the meat is seldom distributed raw to each person: usually an amount of meat is cooked in a large pan and shared equally among the members of several families. When raw meat is passed out, often each family cooks it and piles it into a few dishes, then the members carry it to the hut of the family from whom it was received, or else invite those people to their own hut, and they all eat together. The result is that in a small camp the meat which was painstakingly to each family is perceled out equally again from the beginning.

Smaller game like duikers, steenboks, foxes and jackals will not be divided up on a camp-wide scale, usually going only to people close to the hunter

Still smaller game such as birds, tortoises, hares and springhares, and gathered plants are generally consumed within one family rather than several, but may be shared with visitors and friends. A visitor who arrives during a meal will usually join in the eating: if two people come together, only one of whom has food, it is understood and expected that the food will be shared. A visitor from another camp is the responsibility of the family he is visiting, which must feed him for the duration of his stay

When a large animal is killed, carrying the meat back to camp is perforce a cooperative endeavor among several men. There are many other tasks requiring cooperation in Bushman society, such as preparing a large antelope skin, erecting the huts at a new campsite, etc. At such times the Bushmen cheerfully pitch in to help each other.

While skins for clothing, personal ornaments, hunting tools like poison arrows and spears, and such daily-use items as pans and cups usually belong clearly to some individual or family, not every household owns all of these items; as a result, they are very frequently loaned out or given away

It is valuable to ask how terms expressing reciprocal relationships

such as "share, give, lend, receive, borrow" are used in the Bushman language. "Give", an important and frequently used concept in their language, is expressed for the most part by the words *kie* and *maa*; "distribute" or "share" is expressed by *haru*. The negative of a verb is generally formed with the element *kyua* ("not"), as in *kyua.. .kie, kyua . ..maa, kyua....haru*; the meaning "not give a person his share", however, is expressed by the verb *hxae*. *Hxae* contains the negative meaning within itself, so that *kyua....hxae* would be a double negative: "not withhold a person's share" From this exceptional example we can see the strength of the Bushman's concern with sharing.

To express reciprocal relations the suffix *-ku* is used, but this does not simply mean "to (with) each other" For example, if A *maa-ku*'s a knife to B now, B has an obligation to give to A something of equal value in the near future; the construction */obe-ku* (*/obe* = "lend") refers to the same sort of situation in terms of lending. Attaching *-ku* to *shie* ("take, obtain") results in *shie-ku* "marry"; this is because marriage is clearly considered a sort of exchange between a man and a woman. *Kxoi* ("word, speak") combined with *-ku* means "argue"

Words like *kie, maa* and */obe* differ from words for "give, share, lend, help", etc. in many other languages in that they do not involve any feelings of magnanimity, relative social rank, or the like, but are simply natural and expected acts. Therefore, the recipient of such an act does not feel gratitude, for it is equally natural and expected to receive such acts. This sort of mutual giving and receiving, borrowing and lending, is one form of reciprocal exchange which pays dividends in the future and preserves equilibrium.

The types of reciprocity in a reciprocal exchange have been classified by Sahlins as follows (Sahlins 1965):

1. Generalized reciprocity
2. Balanced reciprocity
3. Negative reciprocity

"Generalized reciprocity" is the most difficult for "civilized" man to understand: seen from the outside, it appears to be a case of one-sided giving of goods, favors, labor, etc. From the point of view of the participants, however, it is believed that it will all even out over time, and it is with this expectation that they give so freely. These exchanges take place in a small society, between people who know each other, and are seen in more advanced societies only within the family or between very

close friends or relatives. "Balanced reciprocity" is direct exchange to satisfy mutual needs and demands and is the standard exchange type in civilized societies. "Negative reciprocity" applies to cases of forced exchange in which one party takes advantage of the other, such as bargaining, speculation, trickery, stealing, etc. It is characteristic of large industrialized societies and occurs between total strangers, enemies, and the like.

The sharing and cooperation among the Bushmen certainly corresponds to "generalized reciprocity" In a small society like the Bushman's, the device of generalized exchange as seen in food sharing and in exchange of women (marriage) is a fundamental principle for the survival of the society. Bushman society consists of only a few hundred individuals, all connected by some sort of kin tie or another, and all acquainted with each other; thus we can say that this is a case of reciprocal exchange on a familistic order.[1]

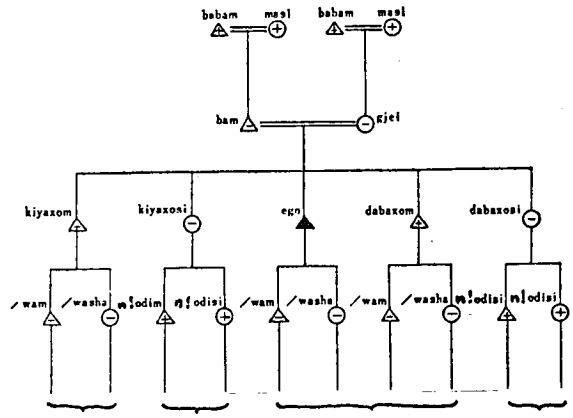
4. The kinship system

Because the CK Bushman society is small, all of its members are involved in a network of relationships with each other People who are closely related are also very closely linked personally, making camp together frequently, sharing food, jointly owning various tools, etc.; further, their behavior are often prescribed by their relationship. Thus it is impossible to think about the structure of Bushman groups without reference to the kinship system.

Bushman kinship terminology is classificatory[2]: ego's parents' same-sex siblings (FaBr, MoSi) are treated as ego's parents, while opposite-sex siblings are called by the same terms as ego's grandparents. Thus parallel cousins are classified as siblings and distinguished from cross cousins. One's cross cousins are designated by the same terms as one's grandchildren. This results in biologically adjacent generations being classificatorily four generations apart (grandparent-grandchild) (cf. Figs. 18 and 19)

Kinship organization among the CK Bushmen is extremely undeveloped, and except for obvious ties between close relatives, descent groups are not recognized. Descent on either parent's side is equivalent; awareness of kin extends vertically for five generations (grandparents to grandchildren) and horizontally only to first cousins. The same is true for affines (cf. Fig. 20) As to people outside of this narrow kinship

Fig. 18 CK Bushman Kinship Terminology (1)



male	+n!odim	-/wam	+n!odim	-/wam
female	+n!odisi	-/washa	+n!odisha	-/washa

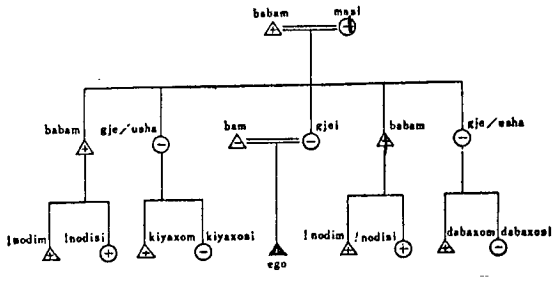
△ male
○ female
▲ ego

═ marriage
| parent-child
⌐ sibling
left to right, elder to younger

+: joking relationship
-: avoidance relationship

Fig. 19 CK Bushman Kinship Terminology (2)

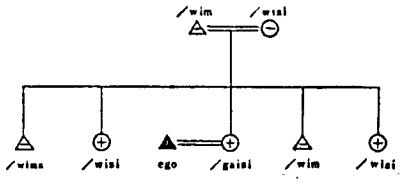
Matrilateral Kin



The relationships are the same for patrilateral kin, but ego's FaBr is *ba/um* and ego's FaSi is *masi*.

Fig. 20 CK Bushman Kinship Terminology (3)

Affines



sphere: older people are called by the terms for grandparents (*babam* and *masi*), while people of the same age group are called *!dowao* (with the suffixes *-m* and *-si* added to refer to men and women, respectively), an intimate term used towards close acquaintances. Since these people do not properly fit into any slot in the kinship system, the constraints on one's behaviors toward close relatives do not apply toward them. The fluid residence groups which we are calling camps do form temporary economic units at given points in time, but the manner of formation of these camps is bound up closely with the Bushman's awareness of kin relationships. Since there is hardly any intercourse between geographically widely separated camps, relationships between people in these camps are rarely recognized. On the rare occasions when such widely separated people meet, there is a certain "consciousness of kind" due to their sharing a common language and culture; but in no way does this lead to the existence of a feeling of an overall social unity

Another aspect of the restrictions on behaviors among the CK Bushmen is seen in the distinction so-called "joking relationships" and "avoidance relationships" Grandparents (*babam* and *masi*) and grandchildren (*n!odim* and *n!odisi*), separated from ego by one generation, enter into the joking category, while parents (*bam* and *gjei*) and children (*/wam* and */washa*), belonging to adjacent generations, fall into the avoidance category. Siblings are divided according to sex: for male ego, his brothers (*kiyaxom* and *dabaxom*) are held in a joking relationship and his sisters (*kiyaxosi* and *dabaxosi*) in an avoidance relationship. A parent's opposite-sex siblings (those called by the terms for grandparents) and one's cross cousins (those called by the terms for grandchildren) are in the joking category, while a parent's same-sex siblings, being treated like one's parents[3], are in an avoidance relationship. Since parallel cousins correspond to siblings, they are naturally differentiated by sex. When marriage occurs among consanguineous kin, the spouse of a person takes the same place in the kinship system as that person. (See Figs. 18, 19 and 20)

People in a joking relationship behave very freely toward each other. They may talk freely, exchanging the most vulgar stories and jokes, or use each other's possessions without permission. Between people in an avoidance relationship, on the other hand, all actions require the utmost discretion, sex is a prohibited conversation topic, and borrowing the other's possessions requires prior permission. The relationship also functions within the marriage system: people in an avoidance relationship

may not marry each other, and marriage between two such people is seen as incest. Within the joking category, particularly free relations hold between ego and ego's grandparents, same-sex siblings, opposite-sex cross cousins, and parents' opposite-sex siblings, to the extent that they may exchange gossip and criticism of others, tell dirty stories, play pranks on each other, etc. Possessions, even including food, are frequently jointly owned, and the degree of tolerance between such people is remarkably high. They can be said to exhibit a very great amount of familistic solidarity. Since, as mentioned before, awareness of kinship extends only to close relatives, the joking and avoidance relationships also seldom extend beyond the bounds of kinship. The principle of alternating generations applies to these relationships, so that if A's parents, for example, have a joking relationship with B, then A and B should have an avoidance relationship. In practice, however, it is not possible to divide all of society precisely into two categories: if the Bushman's society, with such a small population, adhered rigidly to the various strictures on marriage and other social behaviors, poeple would be almost unable to act at all and marriage choices would be limited in the extreme. If potential marriage partners even among distant relations were limited too, the society could not survive. Furthermore, it sometimes happens that joking and avoidance relationships created by marriage conflict with the premarital state of affairs. As a result, these relationships are maintained most strongly among close relatives, weakening as kinship ties become more distant. This also means that the feeling of familistic solidarity decreases as kinship distance increases.

The system of joking and avoidance relationships determines each individual's actions and attitudes in advance; even the ground rules for joint ownership of possessions and for distribution of food are tacitly understood. The system also serves to provide assurance of mutual aid and to eliminate envy and jealousy. The joking relationship, by permitting free exercise of any selfish acts and the airing of complaints and dissatisfactions, provides a valid and harmless outlet for emotions which might create social tensions and rivalries if allowed to build up to the exploding point.

Marriage usually results from a proposal by a man of the appropriate age to a somewhat younger woman. The couples often are engaged for many years, but a man and woman usualy do not marry before the ages of 25 and 18 respectively. The marriage ceremony is said to be a simple one

(Silberbauer 1963), but I did not witness one during my investigation. Although marriage generally takes place between people from the same camp or neighboring camps who know each other well, there are times when no woman of the right age is available and the man leaves home to visit more distant camps. Thus it is not unusual for marriages to occur between people living far apart who had previously had no dealings, and for close ties to emerge between widely separated camps, complicating even further the pattern of shifting alliances of camps.

Polygyny is fairly common in Bushman society. Out of 44 husbands I observed in the ≠Kade area, eight had second wives. This corresponds to about 18% of the total number of husbands. Divorce is also an extremely simple matter, being accomplished by one spouse's leaving the other, so the divorce rate is rather high, although not so high as that of the Hadza of eastern Africa[4] In a self-sufficient hunting and gathering society, division of labor by sex is necessary; therefore, unless a person is very old, he or she will not long continue a single life after divorce or the death of a spouse but will remarry as soon as possible. Both levirate and sororate marriages[5] are seen whereby a child will be raised by his parents' same-sex siblings (classificatorily his parents). Another cause of multiple marriages is doubtless the unbalance in the ratio of men to women. In particular, in a small society like that of the Bushmen, monogamous pairings are insufficient to get everyone married and into a family. The women generally outlive the men, but neither men nor women seem to live past 50 very often (cf. Fig. 10) Again, since men more than women tend to remarry even at an advanced age, old unmarried people are more commonly women.

5. Political organization

The term "political organization" is used for convenience to refer to the various organs which serve to maintain order in a society; in Bushman society, however, no real political organization is descernible. There is no stratification in the form of social ranks or classes, and each person is in principle equal to all others and has access to all the necessary elements of livelihood. The society is based on the principle of egalitarianism. Differentiation of social or cultural functions is remarkably undeveloped, being based almost solely on sex and age differences.

The phenomena of differentiation by sex, as in the division of labor in hunting and gathering, and differentiation by age, as in the distinction

between adult "providers" and the young and very old "dependents", were doubtless epochmaking events in the history of the evolution of primates, tied to the emergence of human family However, these are in large measure developments on the biological dimension, and Bushman society does not show differentiation of function on a more sociological level, such as the development of occupational specialists or a system of leadership through authority. Thus there is also hardly any political organization.

Division of labor by sex is rather precise. As we saw in Chapter 3, the Bushmen's livelihood rests on the women's foraging; the hunting of the men is an unstable endeavor which yields small dividends at irregular intervals, and which is far less important than the work of the women in the food life of the Bushmen. Despite this disparity, there is no difference in status between men and women, due to the fact that meat is a highly-valued food-- to the extent of being called "the only real food"-- and that it is the men who bring it into camp through their hunting.

Although children participate hardly at all in the economic life, they are nonetheless recognized as full-status individuals and are treated with great indulgence. They play very freely, beg food, and generally are permitted to have their way. Older children and adults must take care to ensure the safety of the youngsters. Here there is a clear division of social roles according to age grades; it goes no further than defining the moral relationship between individuals based on their relative ages. In *primitive* societies like the Bushman's one does not have sudden discontinuities as in the civilized societies: the same value system and ethics are maintained always, so that old people do not get left behind on the far side of a generation gap. In this society it is precisely the experiences of life that lead to the accumulation of knowledge, and they may become the source of authority. Hence old people, especially the very old, are respected and may exercise leadership through their words and actions.

A great bowman who is young and sturdy may become respected as a famous hunter, and his opinion in hunting matters will carry much weight. There are also people skilled at incantations to cure illnesses, or at making tools, or at storytelling, and while they do not become specialists, they do take a leading position in activities in their sphere of ability and receive prestige.

There are, then experts who take a leading role in various phases of daily life, and people who can bring the group together, solve problems and settle disputes in certain situations, and these people play an

important part in the workings of the society; they become leaders, however, only in those particular situations or contexts, and in no way does anyone function as a "chief" who could regulate the whole of society.

The words of these individuals definitely carry weight in the areas of their prestige, but only as non-binding suggestions, and there is no compulsion to follow these suggestions. The major decisions in the social life of the Bushmen are taken at the "conferences" in which anyone living in the camp may participate. The "conferences" are not at all formal and do not take place in a special spot. They grow out of the normal everyday chat sessions that occur around the fires in front of the huts, or in the shade of a tree at midday; the participants may be making tools or doing other handwork, or just lying around. While trading rumors and jokes, chatting about the doings at other camps, the movement of game and hunting conditions, they will discuss their plans for hunting and decide the date and destination of their next move. Since the Bushman decries stealing and prefers to settle disputes peaceably, theft and violence are almost unknown. If an altercation occurs or interpersonal frictions arise, a more serious social crisis is averted by geographical separation of the parties involved through group realignment. The most serious quarrels are caused by adultery, but disagreements also arise over the distribution of food. Real trouble over food distribution arises less often over the amount received than over differences of opinion as to who should be the primary distributors and who the secondary. For example, A might receive some meat from C and D and yet complain that it really should have come from B. Such matters will be discussed and any necessary sanctions imposed verbally

Even matters which do not affect the whole camp, such as news of a planned visit by two or three people to another camp, or of one family's plans to leave the group, come up continually in conversations and often are surprisingly fast transmitted to other camps. The Bushmen are conversation addicts and seize on the most trifling matters for joking; they chat and laugh joyously with their rich senses of humor. Chatting is one of the Bushman's main forms of amusement. Sometimes the talk turns serious and may lead to indignant arguing, but these cases usually stop at the level of loud shouting, rarely leading to fisticuffs. Even if things progress so far that one of the parties leaves camp, the memory of the quarrel does not linger long, and when their paths cross again after a while, the two parties commence living together again as if nothing had

happened. Actually, yelling to one's heart's content to discharge dissatisfactions often serves to avert worse social disruption.

Thus, "chatting" or "conversation" plays a large role in Bushman society as a dicision-making apparatus, a communications network, and an amusement and leisure activity

6. The function of dancing

Dancing, like chatting, is a major amusement for the Bushmen, but it is also one of their new religious ceremonies[6] I have repeatedly stressed the relatively short time devoted by the Bushmen to food procurement and the great amount of their leisure time. After a hard period of labor in the hot sun, any human would feel the need to take a break, to talk aimlessly, play games, dance, etc. For the Bushman, whose only amusement other than talking, singing and dancing consists of occasionally joining in the children's games or just fooling around, nothing can make the time fly and delight the whole camp like dancing. While lying around or during pauses in the conversation, both men and women are continually humming or singing snatches of songs; the women, while out foraging, often sing in a high-pitched falsetto. When their hands are empty they will clap along, also stamping their feet in dance. Evening will regularly see a small circle of dancing boys and girls singing joyfully at the top of their lungs.

Full-scale dancing called "gemsbok dance", lasting over a longer period, is seen only in camps with at least a few dozen people to do the singing and dancing. These larger dances often take place after a successful hunt or during a period of abundant food, rarely occurring in less plentiful times. A large number of participants increases the excitement, and the presence of meat maximizes the Bushman's joy. Since dancing of this sort requires great exertion over a long time, it does not occur unless the Bushmen have first been able to satisfy their bellies.

This "real" dancing, as mentioned, is religious rite, having great significance for the well-being of Bushman society. The Bushmen are basically realistic and rational, having no systematic beliefs about any supernatural powers and no interest in matters not related to their daily lives, but they do have recourse to the concepts of a god (*n!odima*) and an evil spirit (*g//wama*) to explain the creation of the world and the mysteries of natural phenomena. *N!odima* represents all that is good, and through him they explain the good things in their lives. He is the creator of all things, including of course the animals and plants that provide the Bushmen

with food. Further, he causes rain, makes plants grow, and saves men from starvation and drought. On the other hand, it is *g//wama* who represents all that is bad; he is blamed for such things as drought, illness, injuries, enemies[7], and misfortunes in general.

Religious ceremonies among the Bushmen are surprisingly rare. There is no praying or offering of sacrifices, nothing but incantations against sickness, smoking of giraffe hide or antelope horn to bring rain, and the aforementioned formal dancing. dancing, which functions not only in curing sickness but in driving away all the evil spirits wielded by *g//wama* and in delivering peace and relief, is the most important of these.

Dancing usually commences in the evening but may rarely occur during the day. It is not uncommon in good times for dancing to continue all through the night until the sun is high in the sky the following day. The women sit in a circle around a small fire, clapping their hands and singing, while the men dance around them in time to the singing. Singing is high-pitched and frequently employs falsetto. A small repertoire of similar short tunes, monotonous and mournful, is repeated over and over. The dancing too is very monotonous: the dancers simply go forward, vigorously stamping the earth now with alternating steps, now with both feet. The songs and dances continue for a few minutes at a time; in between the Bushmen smoke tobacco and take short rests. Much exertion is required for the dancing, which is performed in a slight crouch with strong steps. The dancing men also sing in a deep voice along with the higher-pitched voices of the women. In between the shrill choruses of the women, the men's low restrained voices combine nicely. At first hearing, the unfamiliar melodies are rather unsettling, to the extent that one even fears that one's mind might go; as the melodies become familiar, however, one's whole body gradually and imperceptibly begins to fall under their influence, until the realization hits that this is powerful music. when someone is sick, he or she is made to crouch down in the middle of a circle of singers. The men move slowly around the circle; both hands on the woman or sick person, pulling her/him around the waist, etc. Because men are usually stronger than women, evil spirits do not approach them, sneaking instead into the bodies of the women. Through the continued laying on of hands, the men gradually absorb the evil spirits into their own bodies. Finally, as the dancing reaches its peak of excitement, a few of the dancers fall into a trance-like state, losing contact with their surroundings. This is a result, of course, of the accumulation of evil spirits in their bodies.

The enraptured men, feeling good, eventually fall to the ground, mindless of where they may land. Even if one should fall into the fire, he does not feel the heat; he must quickly be dragged to safety and allowed to sleep it off. When he regains consciousness after a while and stands up, he lets out a cry that seems to be wrung from the depths of his bowels and begins to sob violently and loudly; then someone will embrace him from behind and look after him. When at last he has completely regained his senses, the evil spirits have been driven from his body, and all bad elements have been exorcised from the now-purified camp. Because the Bushmen believe this, peace and a feeling of security return to the Bushmen camp.

7. Fission and Fusion of the Residence Group

The Bushmen, as outlined in Chapter 3, are a hunting and gathering people who must move with the seasons; a salient feature of this nomadism is the frequent shifts in the composition of the residence group. Just as there is great variation in the length of stay of a group in any one camp, ranging from a few days to several weeks, so the membership too may vary over time from a handful of people to a few dozen. I would like now, having first made clear the fluid nature of the ever-changing Bushman group, to make some observations on the relation between group formation and such factors as food procurement and other social institutions, kinship and political systems, and the Bushman's way of thinking, touching also on the structure of the group as a mode of adaptation.

The smallest social unit among the Bushmen is the family. Chapter 3 explains that the Bushman's livelihood rests on the foraging activities of the women and the hunting of the men. It was also noted that children and immobilized oldsters depend on the healthy adult "providers" for their support. With men and women combining as spouses and with the agewise division between providers and dependents, the family is both the smallest and most indispensable unit in Bushman society; it is also the unit of self-sufficiency Moreover, since its membership does not change except through birth, death and marriage, the family is also the only permanent social unit in bushman society.

The Bushmen have no abstract concept of the group, no word to refer to the family or the residence group. Few other groups are known that possess no terms for the family or similar units. Regardless of the presence or absence of a name, however, the family exists in some form or

other in all human societies.

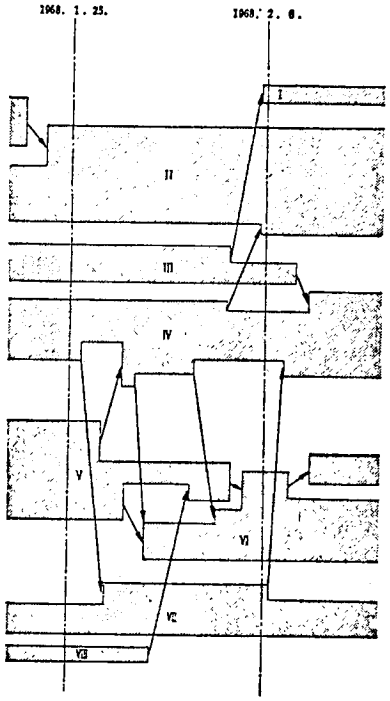
The basic form of the Bushman family is the nuclear family consisting of husband, wife and unmarried children. After marriage, an adult child lives in a hut separate from his parents' and conducts his life independently. When old people lose their mobility, they are supported by their children; as long as they are able, however, they make their own living (although they live in the same camp as their children, exchanging food and always keeping close ties). The average family size is five--husband, wife and three children, with examples of more than five children being rare. For the hunting of large game, and for certain other cooperative endeavors, one family is not enough; for the dance and various other social activities also, it is common for several families to combine into a camp of a few dozen members; still, it frequently happens that one family will live alone for a few days or even occasionally for many weeks. The residence unit known as a "camp", then, consists of from one family (a few people) to around twenty families (some 100 people), a common size being around ten (i.e. several dozen people) Figure 21 shows a part of the shifts in group membership during a given period.

As can be seen in Fig. 21, the various groups (or camps) continuously fragment into components which combine with parts of other groups, with no group retaining an invariant membership. The movements and choices of campsites of each group, while determined partly by the availability of food, also depend on the relative location of other groups. Although some groups camp within as little as two or three kilometers of their nearest neighbors, a separation of 10 km. or more is more common. Figure 22 shows the distribution of camps at a certain point in time.

Since camps consist mainly of collections of families, one can think of the shifting composition of a group as changes in the roll of its member families (or family clusters) Very frequently people will leave their families temporarily to visit another camp. Such visits usually last only a few days, but on rare occasions the visitor will stay longer, joining his new campmates in their food-getting activities and even in their movements. We might assign to this kind of case more significance than just a visit, including it as a type of membership shift; but except when the visitor has a spouse in the camp visited or acquires one there, I will simply treat it as a kind of visit.

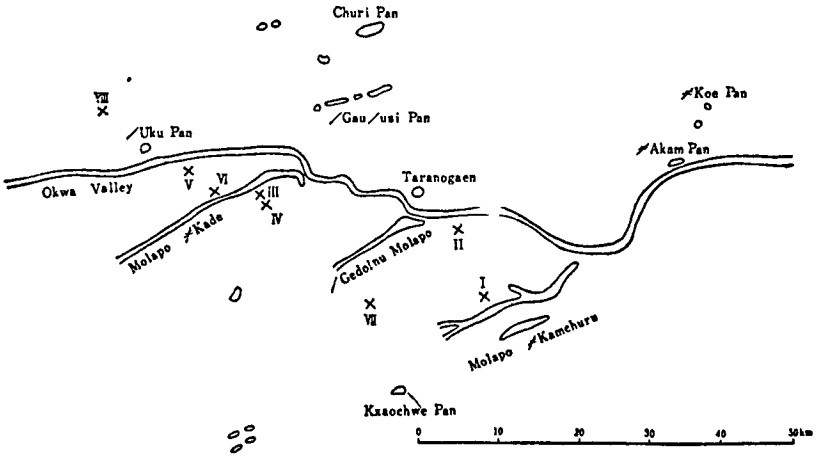
The question arises, why must the Bushmen so frequently repeat the process of realigning their groups? I think we can look at it in the

Fig. 21 An Example of Shifting Alliances



Arrows indicate movement.

Fig. 22 Distribution of Camps, Jan.25-Feb.6, 1968
(cf. Fig. 21)



x marks locations of camps.

following way. The factors in the splitting up of a group, or in the formation of a large group from several smaller ones, are far from simple. They include both biological factors such as food and sex, and social factors such as marriage, exchanges, social rite, and alleviation of tense social relationships. Sometimes they function to enlarge the group, sometimes to shrink it. These various factors combine intricately to effect the shifts in group composition.

1. Adjustment of group size to food distribution and density. From the latter half of the rainy season into the early dry season, when food is varied and abundant, large groups of people can live together in one spot, while at the same time small groups of family size can also get along. During this period groups form at their own pleasure. From the height of the dry season to its end, food is desperately scarce in the Kalahari, forcing the Bushmen to regulate the size of their groups in response to food distribution and density. In general, when food is scarce the living groups must be smaller. Rarely, when a "desirable food" is still growing in one place only, a large concentration of population will be found there. It is in this period that living things, including man, are most directly under the control of the environment. I observed that from August to the end of September 1967 the approximately 200 Bushmen, almost whole population living in the ≠Kade area, seeking the fast-disappearing melon *Citrullus lanatus*, lived in three camps concentrated within a 500-meter radius of the /Karu campsite. When the melon supply was finally exhausted in that area, the bushmen moved off once again in smaller groups.

2. Consolidation for cooperation. Hunting of birds and hares, snaring small antelopes and the like can be done by a single hunter, but hunting large game is only possible with the cooperative efforts of several men. There are also various processes such as tanning hides and making hunting implements which require cooperation. To carry out such endeavors it becomes necessary for people to join together in one camp. Far and away the greatest incentive for Bushmen to form larger groups is the lure of meat. Since the family is a self-contained economic unit which can provide itself with a sufficient amount of food, the Bushmen do form small groups of one to a few families which camp together for a few days or weeks; at such times, however, they subsist almost solely on plant food, rarely including any small game in their diet. It is also impossible for them to catch enough small game at one time to satisfy their cravings for meat. Considering meat to be "the true food", the Bushmen cannot tolerate a long

period without it. After having lived in a small group for a while, they will join forces with a larger one.

3. The security offered by living among a large number of people is far greater than that obtained by making camp as a single family With the exception of *Bauhinia macrantha* beans and dried meat, food is not stored against an emergency. For the Bushman, living from day to day, the loss of food-getting capabilities through illness or injury could mean starvation for his family. If he is a member of a small camp, his sickness becomes a big burden directly affecting the entire group. Were he living in a large group, he and his family could easily be supported by the others, and the burden imposed on the group is lightened. In such a case the other people in the camp would as a matter of course share their food with him; in fact, they would come to his aid in any situation. As related in the earlier part of this chapter, this is the nature of bushman society. The question of the increased security of the individual in this group lifestyle probably does not tie in directly with shifting group alignments: it is a matter that surfaces only in cases of unforeseen disasters, etc. Still, it must not be forgotten that the Bushman is subliminally aware of these facts and thus has a tendency towards consolidation.

4. Vagueness of territoriality. Due to the fact that the distribution and density of food are uneven and also vary from year to year with the rainfall, Bushmen cannot tie themselves to a fixed segment of land. They must be able to make camp wherever there is food within their broad range, selecting their sites with consideration of the location of other groups. Further, the constant intercourse among camps, in the form of visits and the like, renders the concept of territory extremely vague. This lack of a system of territoriality makes the constant realignment of groups all the more easy.

5. Visits between camps. Visits to other camps are most frequently conducted by from one to several men, occasionally accompanied by women and children. Although they play an important role in passing news between camps, the three main purposes of visits are (1) to see relatives and friends, (2) to procure needed goods (through trade or simply as gifts), and (3) to find a mate; it is common, in fact, for all of these purposes to be served by the same visit. That is, whatever camp the Bushman visits, he will certainly encounter some relatives, friends or acquaintances and probably swap items such as leaf tabacco or wire for making arrowheads with members of that camp. A young man goes to woo the girl that has

caught his fancy, while a married man may talk with the relatives of the girl after his heart about obtaining a second wife.

When a marriage occurs between groups that usually have little to do with each other, new kinship ties come into being. New intergroup contacts are created, and the pattern of shifting alignments becomes ever more complex. In this way visits between camps become one cause of the changes in group configurations, at the same time representing one aspect of these changes and also contributing to the fluid nature of Bushman residence groups.

6. Gathering for social ceremonies and events. Dancing, ceremonies welcoming boys and girls to adulthood, weddings, etc. require the presence of a large number of people. Dancing, the most common social activity, functions both as a religious ceremony and as a major form of amusement. After living for some time in a small group, people doubtless grow lonely and yearn to get together with friends and relatives in other camps to chat gaily, sing joyously and dance. These things can be thought of as encouraging group mergers.

7. Group fission to relieve discord and social tension. Sharing and cooperation are the most important and regularly observed social institutions, being function smoothly enough. As mentioned earlier, the individual has a strong sense of possessiveness and usually tends to think egocentrically; as a result, it often happens that trouble arises over the distribution of especially coveted items of food. A man may sneak a small catch of game into his hut to share only with his family, or otherwise fail to share food as he should. But real trouble occurs most often over differences of interpretation concerning the order of distribution--who should be the primary distributor, who the secondary, etc. Thus quarrels and discord occur most frequently over food distribution; however, trouble also arises occasionally over the opposite sex. Men often scramble for the affections of a woman, and a wife may take advantage of her husband's absence to commit improprieties with another man. Adultery usually ends without either party's spouse finding out about it, but should one of them learn the truth it will lead to a serious quarrel. While it is extremely rare, petty theft does occur. There are always personal differences arising out of people's characters or temperaments, and quarrels and dissension due to other interpersonal entanglements also may provoke a rift within the group.

In Sections 3 through 7 above I have approached from a number of angles the question of what devices the Bushman uses to maintain social integration. After briefly looking back over these, I will consider the significance of the flexible group structure found among the Bushmen.

The Bushmen dislike resorting to violence; whenever possible they try to solve disputes peacefully instead of aggravating the situation. There are no mechanisms for governing or ordering in this society: order is maintained as each individual tries to follow the proper social course according to his conscience. The most effective social principle and the one which is most vigorously observed--to the point of being almost compulsory--is the principle of sharing and cooperation. Sharing and cooperation, which lead to great interdependence, function in close relation to the kinship system. Within the concentric spreading out of kindred and joking relationships, familistic cohesion is especially strong among close kin; two people, within these strongly cohesive relationships have a high degree of mutual permissiveness, they also exhibit a high degree of sharing and cooperation. On the opposite side of the coin, as familistic cohesion weakens with increasing kin distance, the obligatoriness of sharing and cooperation also fades away. Actually, because the whole society is so small, all of its members know each other at least by sight, so that even if there are dyads which do not exhibit a close kin relationship (kindred or joking relationship) the society as a whole is still based on a sufficiently strong degree of familistic cohesion. The Bushmen respect the aged, experienced, and able and turn to them for social leadership, but decisions and solutions to problems are always based on discussion among the whole group.

Even within the extremely egalitarian and peaceful Bushman society, people are constantly in fear of such disasters as sickness and injury and of that imcomprehensible phenomenon, death; they must also confront the problems arising over food, sex, and various complications in interpersonal relations. These considerations are sufficient to keep the Bushman and his society always in crisis. Through their formal dancing they drive away all the evil brought by *g//wama*--sickness, injury, starvation, drought, and death. The Bushman depends on his conscience and self-awareness to keep him in line with social norm, and tries to follow the proper social course. When jealousy, discontent, dissension and the like are brewing, they are dissipated within the close familistic kin relationships and joking relationships, or through amusements such as dancing, singing, and chatting,

or otherwise sublimated into recreation. Unlike more advanced societies, however, the Bushman's camp, consisting of only a few dozen people, brings all its members into contact day after day and forces people to continue living together even if they are at odds. After a while in such a communal life style, there are bound to be conflicts that go beyond simply argument and malicious gossip. Among these conflicts in turn there are those which cannot be resolved through the mediation of a third person or through diversions such as chatting or dancing. It seems that the most effective method of disposing of such cases is through camp fission and the resulting geographical separation of the principals. I observed any number of examples where a person would leave the camp after saying things like: "He won't share his meat with me," "He's trying to steal my woman," "I can't live any longer with a selfish person who won't share his food," "If I live together with him I'll be killed," etc.

This sort of interpersonal friction occasionally is the direct cause of a group split, but there is not always a proximate reason for a split. In fact, it seems that breakups resulting from such less direct motives as food availability of plans to visit another camp are far more common than those due to surfacing interpersonal disputes. I have continually stressed the fact that Bushman society is premised on mobility, but the constant changes in the composition of the group and the realignments which result from the process of moving form another important element in their society. For a person to leave one group, form another, and then join up with yet another is a commonplace occurrence for them. The people may not have been getting along temporarily with the others in the first group, or perhaps they thought they could find food more easily somewhere else. Or maybe they wanted to live with the people in another camp for a while, or simply wanted to live in a smaller group. Whatever the case, to the Bushman it is not a matter of forsaking or deserting one group or being driven from another, it is simply that *some people decided to live in a different place from that group*.

It is important to realize that this fluidity of residence groups, which is a normal concomitant of the Bushman life style, functions most effectively to check or defuse the various interpersonal frictions that arise in a group life style, to alleviate social tensions and avoid crisis. The various camps which are the residence groups of the Bushmen are themselves quite unstable and temporary, but precisely because of this the whole of Bushman society has an extremely flexible internal structure and

possesses an enduring overall stability The phenomenon of continually shifting group alliances which results from the demands of mobility, whether it is a conscious or unconscious process, is a beautiful example of adaptation, having developed into an important element in the maintenance of the group; and although I have discussed the importance of sharing and cooperation and of the family as the minimal living unit, for Bushman society with its undeveloped kinship and political organization, this remarkable adaptation is crucial to the maintenance of groups larger than the family

8. Patterns of residence group formation

Close observation of the Bushman camps and their movements and changes reveals that the formation of groups, far from being random, is tied in a regular manner to family relationships. Except for occasional visits to other camps, a few days' absence of men on the hunt, and the like, there are usually no splits within the family; thus we can take the family or the family group as the basic unit in the formation and re-formation of residence groups (cf. p.65 and Fig. 23)

There are rare cases in which a family has no known kinship with other persons, but the great majority of families are bound by some sort of relationship to other families. There is a tendency for related families to belong to the same residence group; moreover, families connected by parent-child or sibling relationships sometimes form an enduring *cluster of families.*[8] Lee says that the !Kung of the Dobe area form sibling-based "concentric circle" clusters centering around the permanent water holes[9], but that there are no other bases for group formation (Lee 1965) Lee also suspects that the clusters of families I observed among the G/wi and G//ana would not continue to exist over a long period (Lee, personal communication), but since none of these clusters, or almost none, broke up during the period of my observation, I rather think that they play an important role in the structure of CK Bushman residence groups. The principles or bases for formation of the various clusters of families are shown in Fig. 24. These principles are summarized in Table 16.

Of the 18 clusters whose genealogies I was able to trace, five consist of a single nuclear family. In these cases the families had almost no other close relatives. Of the 13 clusters formed from more than one nuclear family, the twelve other than B all include families linked by

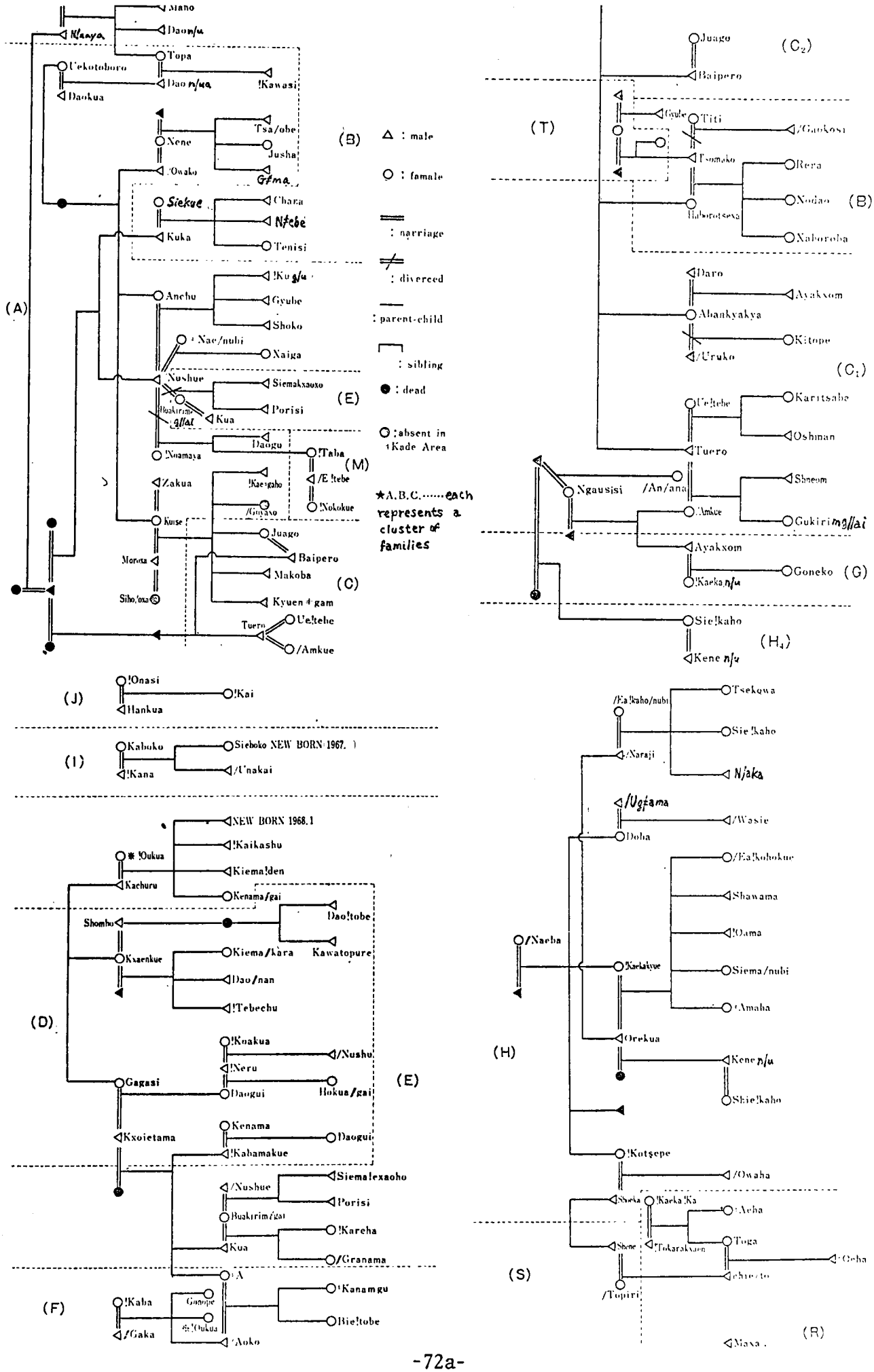
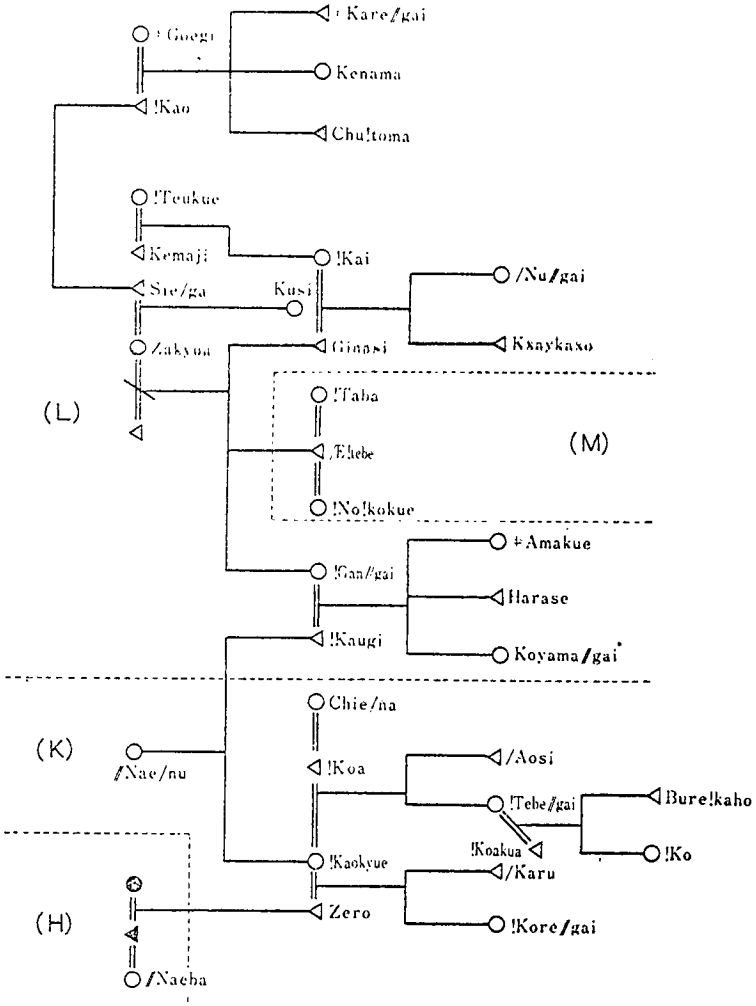


Fig. 23 Kin Relationships among the CK Bushmen of the ≠Kade Area


!Goegi
!Kare/gai
Kenama
!Kao
Chu!toma
!Teukue
Kemaji
!Kai
/Nu/gai
Sie/ga
Kusi
Kxaykaxo
Zakyoa
Ginasi
(L)
!Taba
(M)
/Elebe
!No!kokue
+Amakue
!Gan/gai
Harase
!Kaugi
Koyama/gai
Chie/na
(K)
/Nae/nu
!Koa
/Aosi
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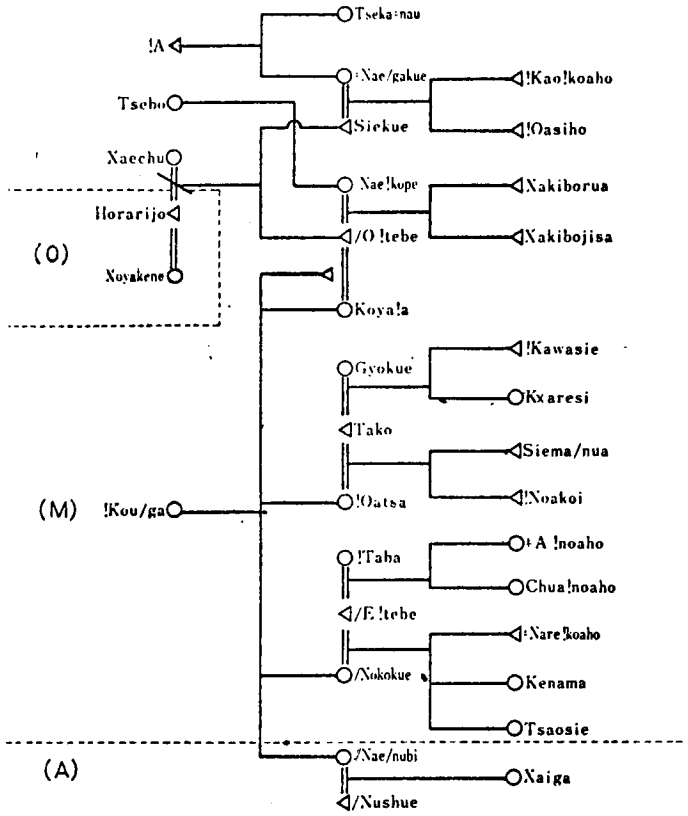
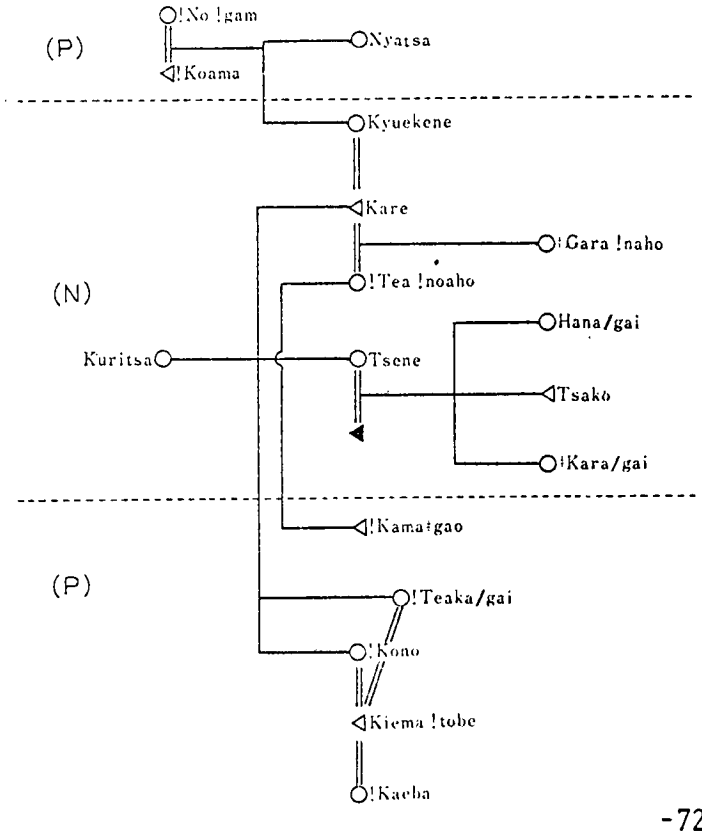
/Karu
(H)
Zero
!Kore/gai
/Naeba


Tseka+nau
!A
+Nae/gakue
!Kao!koaho
Tsebo
Siekue
!Oasiho
Xaechu
Nae!kope
Nakiborua
Horarijo
(O)
/O !tebe
Nakibojisa
Xoyakene
Koya!a
!Kawasie
Gyokue
Kxaresi
Tako
Siema/nua
(M)
!Kou/ga
!Oatsa
!Noakoi
!Taba
+A !noaho
Chua!noaho
/E !tebe
+Nare!koaho
/Nokokue
Kenama
Tsaosie
/Nae/nubi
(A)
Xaiga
/Nushue


!No !gam
(P)
Nyatsa
!Koama
Kyuekene
Kare
+Gara !naho
!Tea !noaho
(N)
Hana/gai
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!Kono
Kiema !tobe
!Kaeba

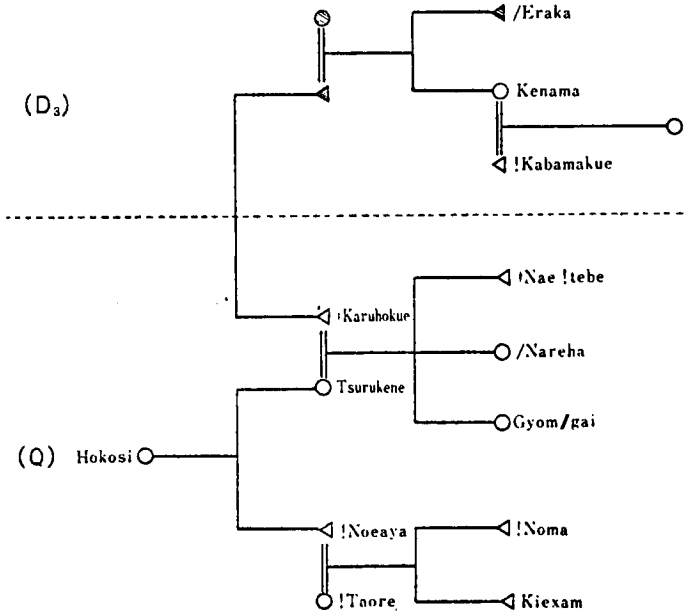

/Eraka
(D3)
Kenama
!Kabamakue
+Nae !tebe
+Karuhokue
/Nareha
Tsurukene
Gyom/gai
(Q)
Hokosi
!Noeaya
!Noma
!Taore
Kiexam

Fig. 24 Principles for Formation of Various Clusters of Families

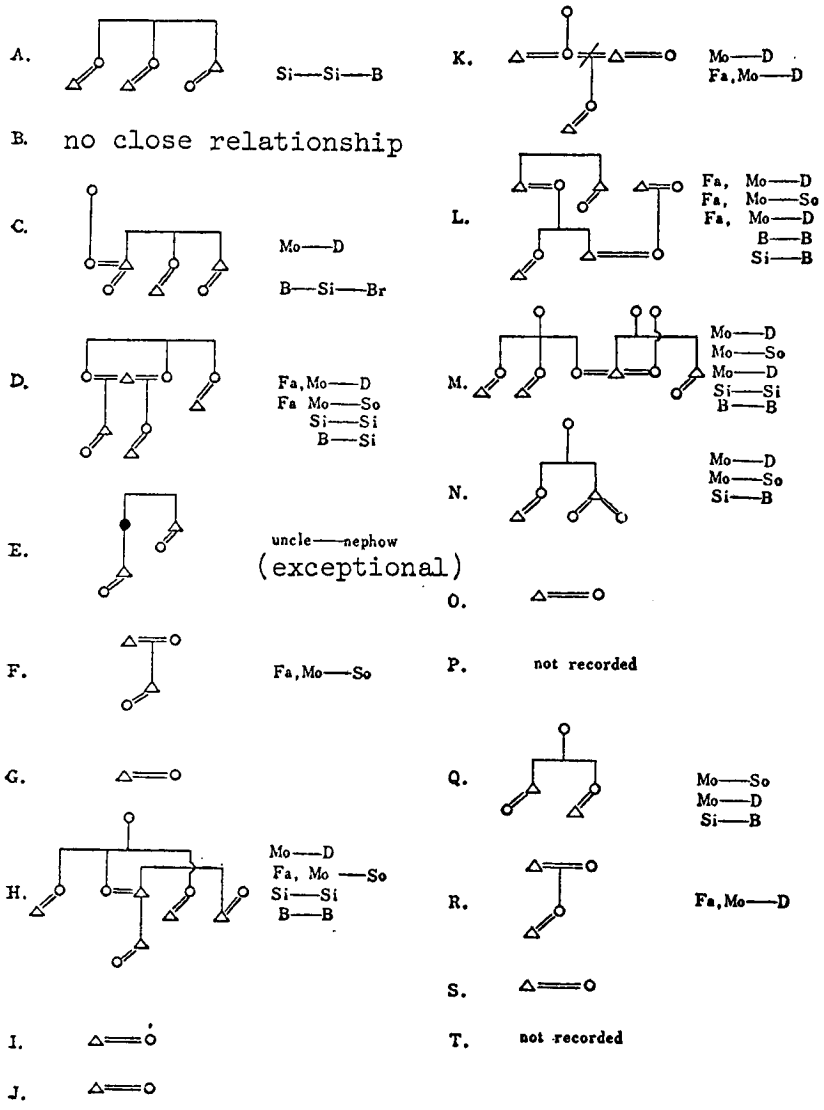


Table 16. Basis for Formation of Clusters of Families

relationship	number	
Fa, Mo—D	5	10 parents—Children
Fa, Mo—So	5	
Mo—D	7	10 mother —Children
Mo--So	3	
Fa--D	0	0 father —Children
Fa--So	0	
Si--Si	4	14 Sibling
Si--B	6	
B --B	4	

either parent-child or sibling relationships or both. In other words, eleven of clusters of families include a total of 20 parent-child relationships, and 9 of the clusters include 14 sibling relationships. Table 16 shows that 12 of the linkages are parent-daughter ties, while eight are parent-son, so that there is some variation according to sex; the paucity of examples, however, prevents us from concluding that Bushman society is uxorilocal. The total absence of father-child examples is due to the generally shorter life span of males added to the fact that men, even at an advanced age, tend to remarry more than women. We can schematize the cluster structure as shown in Fig. 25.

A newlywed couple will live with the parents of one or both of them, which immediately creates a cluster with a parent-child bond; further there were probably already siblings of one or both of the newlyweds living with their parents, so that a sibling bond is also in existence. This is Stage I. Eventually the parents die. Even if the mother, who is usually younger and longer-lived, should die first, the father will usually remarry and thus add a new mother to the cluster, so that eventually we come to Stage II: an aged widow at the apex of the family tree. Finally the mother dies, bringing the cluster to Stage III. According to Woodburn, Stage II with the aged mother at the apex is the most obvious one in group formation among the Hadza, and the society has a tendency toward uxorilocality (Woodburn 1968b). This structural principle is schematized in Fig. 26.

However, since in the case of the Hadza, as with the CK Bushmen, lineages are not traceable in detail, one cannot speak of a matrilineal kinship organization. Woodburn instead describes both the Hadza kinship system and the residence system as matrifocal (Woodburn 1968b). The Bushmen stress neither the husband's nor the wife's side in particular; if one were to assign a name to their residence system, it might rather be pragmaticolocal.

The clusters of families are then, built up through parental and sibling relationships, but on what basis are these clusters combined into camps? The factors are many and varied, as are the groups resulting from them.

The shifting alignments in CK Bushman residence groups during the period of my first investigation (9/67 - 3/68) are shown in Fig. 27 From this diagram it can be seen that each family cluster frequently makes camp with certain other clusters but not with some others. The frequency of camping together expresses the degree of intimacy between the people and clusters involved. Groups of clusters which show a high degree of intimacy

Fig. 25 Transition of Phases in Cluster of Families According to the Lapse of Time

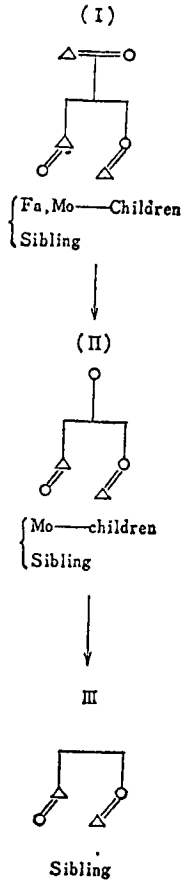


Fig. 26 Principle of Group Formation in the Hadza in East Africa

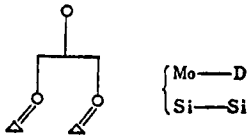
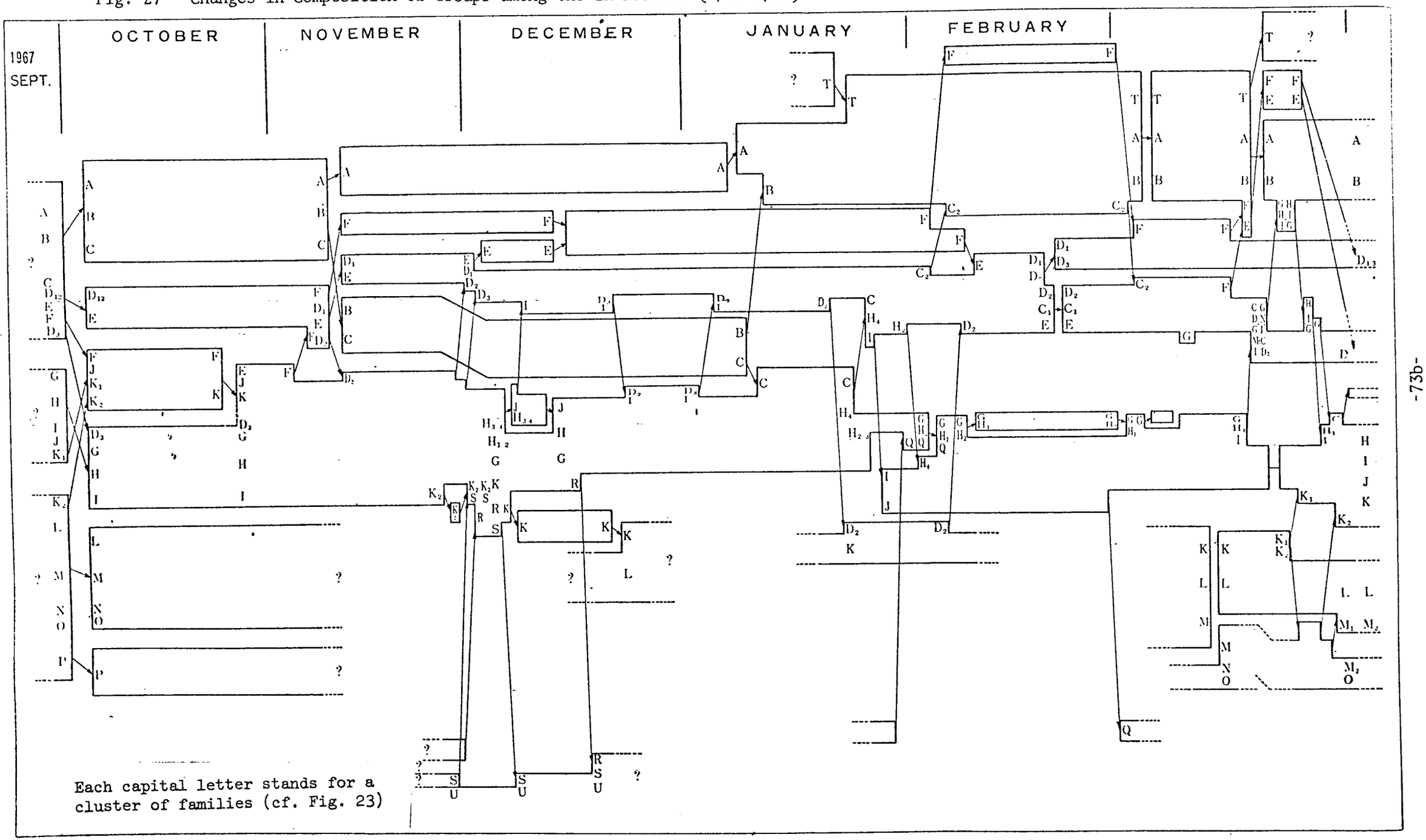


Fig. 27 Changes in Composition of Groups among the CK Bushmen (9/67-3/68)

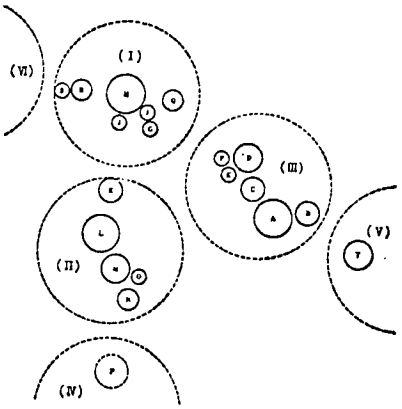


be virtue of frequency of grouping are A-B-C, D-E-F. G-H-I-J, K-L-M and R-S. All of these groupings are based on those mutual kinship ties, as shown in Fig. 25, with the exceptions of G, I and J which have no close ties with other cluster.

Figure 28 is an attempt to schematize the various degrees of intimacy among the clusters of families which combine to form the groups of Fig. 27 Figure 29 expresses the various parent-child and sibling relationships connecting the clusters. It can be seen that, within the groups which most frequently live together (enclosed in dotted circles in Figs. 28 and 29), many of the clusters are linked very closely by kinship, namely H-S-R in group (I), K-L-M-O in (II), and A-B-C and D-E-F in (III) It is extremely common to visit the parents and/or sibling(s) of the mother or father and to join their camp. In other words, in the formation of the residence group too, the strength of the parental and sibling ties is the most important combinatory principle. Of course, these ties are not the only factors in group formation: more distant relationships also link some groups, and groupings based on interpersonal relations can be seen in the cases of G with H, K-L-M with N, and A-B-C with D-E-F. There are also groups formed, although not very frequently, which cross the dotted lines of Figs 28 and 29. Most of these are based on close relationships and require fairly long trips (H-K, N-P, A-M, C-G, and B-T), but there are also cases involving distant or noknown relationships.

Looking at it this way, the connection between the concentric structure of kinship ties, discussed in Section 4, and the formation of residence groups becomes clear. Figure 30 schematizes the areal groups[10] centering around ≠Kade that I either observed or was able to infer the existence from other information. Judging from the degree of tendency to combine (more concretely, the frequency of coresidence of the family clusters), a clear pattern of concentric circles around ≠Kade emerges such that groups within any one circle, however far separated, tend to combine with each other as often as with geographically closer groups. These ties seem to agree very well with the concentric spreading out of kin from a central point. The overlap between kinship organization and group structure is easy to understand if one reflects on the operation of the principles of sharing and cooperation discussed in Section 3. Namely, sharing and cooperation relationships are as pervasive as the human relationships based on kinship and familistic bonds, and people involved in such relationships naturally tend to live together. Thus we see the formation of

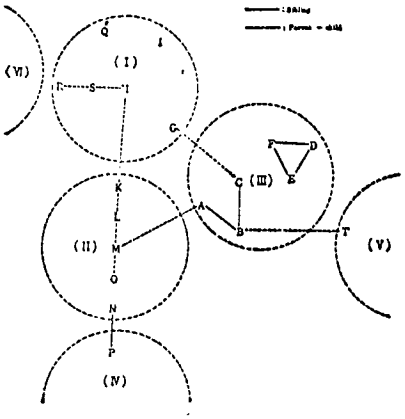
Fig. 28 Degrees of Intimacy within Groups



The various small circles represent clusters of families: their size corresponds to the number of people in the cluster. Distance between circles represents degrees of intimacy: the closer the circles, the more often the clusters make camp together.

The larger dotted circles enclose groups of clusters which frequently camp together. The relative locations of the circles also roughly indicate the relative geographical locations of the groups.

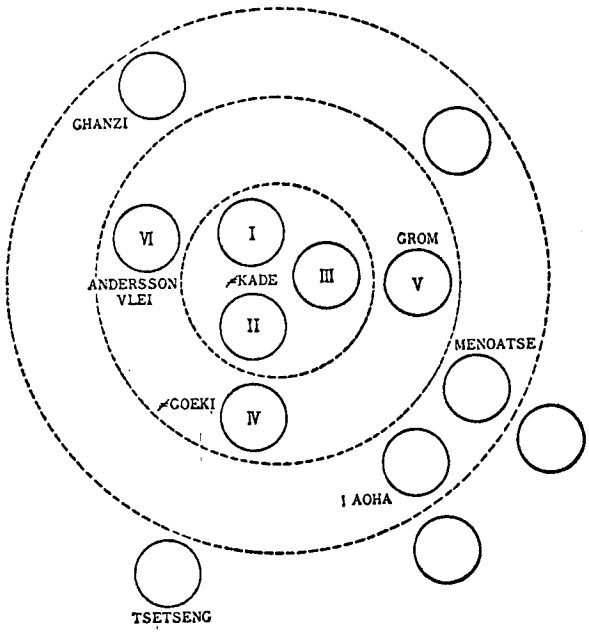
Fig. 29 Kinship Relations between camps and within camps



—— : sibling

····· : parent-child

Fig. 30 Distribution of Areal Groups* Centering on the ≠Kade Area



* cf. Chapter 4, Note 10

a diverse residence group based on a number of factors in addition to parental and sibling kin ties: friendship, relations with the opposite sex, visits for purposes such as social functions and trade, etc.

9. Bushman society: a summary

1. Bushman society is grounded in the principle of egalitarianism. Notions of rank and status, class, social distinctions based on occupation, etc. all are primitive and undeveloped.

2. The Bushmen are a cheerful, optimistic people, poor in time sense and rich in humor They are prudent in interpersonal relations, yet they also have a basically egocentric way of thinking.

3. The system of exchanges I have referred to as sharing and cooperation forms the basis for the survival of this hunting and gathering society.

4. The kinship system is undeveloped. Descent is equivalent on either parent's side, but in general awareness of kinship only extends vertically for five generations (grandparents to grandchildren) and horizontally as far as first cousins. Although there is recognition of ego-based kindred, there is no unilineal descent group here such as a lineage or a clan. Kinship terminology is classificatory Also, in principle a sort of bipartite structure exists whereby joking and avoidance relationships alternate by generation and sex.

5. Familistic bonds are seen among kindred and between people who are in a joking relationship; in these cases sharing and cooperation is extreme and permissiveness is great. As kinship distance increases, familistic solidarity declines and sharing becomes less compulsory. People in an avoidance relationship are very reserved toward each other and must repress their individual desires. These behavior patterns play a major role in reducing social tension.

6. There is no power to rule, order, judge or lead invested in any individual or organization. There are people who may take the lead in certain situations, but it is the individual conscience that leads one to act in a socially acceptable manner and that maintains social stability.

7 Social decisions ultimately are made at a "conference" in which all members of the camp may participate.

8. Resting, chatting, singing, dancing and other such leisure activities help to sublimate or eliminate desires, discontents, and interpersonal friction.

9. Dancing in particular relates to their religious beliefs, func-

tioning to exorcise evil spirits from society

10. It is hard to believe that Bushman society with its primitive social structures can resolve all its tensions and conflicts and function smoothly with the limited array of devices discussed in this chapter, but in fact the most efficient device for maintaining social equilibrium is the free and fluid group structure.

11. The fluid group structure is most clearly seen in the realignment of camps which accompanies relocation; in fact, however, there are various causes of this fluidity: biological ones like food and sex, sociological ones like marriage, ceremonies, amelioration of social tensions, etc. This is the most marvelous adaptive form in Bushman society

12. The largest enduring group among Bushmen is the family; families combine into considerably stable clusters of families. The living unit is a camp, a temporary union of several families. A number of camps which frequently exchange members can be said to form an areal group. Residence groups seem to spread out in concentric circles around one areal group, thus duplicating the concentric structure of kinship relations.

13. The various groupings larger than the family are not to be confused with bands as corporate groups.

14. The formative principles of the group are the parent-child and sibling relationships, and the residence system is pragmaticolocal.

Notes to Chapter 4

1. The term "familistic" was used in Service's 1966 book, *The Hunters*, since it applies so fittingly to Bushman social relations, I use it occasionally hereafter

2. Because the Bushman language distinguishes gender, kinship terms must express gender through suffixes. The suffix *-m* is attached to terms designating males, while *-si* or *-sha* designate females.

3. The parents' same-sex siblings are regarded as parents, but strictly speaking they are not called by the same terms. The element */u*, meaning "in-low", is affixed, so that FaBr is called *ba/um* and MoSi is *gje/usi*.

4 According to Woodburn (1968b), divorce is very common among the Hadza: there are approximately 49 divorces for every 1,000 years of marriage. Winter writes that the divorce rate among the Bwamba is 31.5/1,000 years. For reference, the rate in England from 1950 to 1952 was 2.8, while in the United States from 1949 to 1951 it was 10 The rate for the Bushmen is estimated to be above 20.

5. When a man marries his dead brother's wife, it is known as a levirate marriage; when a man as a matter of course marries his dead wife's sister or cousin, or when he takes such a person as a second or third wife in a polygynous system it is a sororate marriage.

6. Silberbauer says that religious ceremonies among the Central Kalahari Bushmen include marriages and adulthood ceremonies for both men and women. Both are simple and consist mainly of dancing (Silberbauer 1963) I was able to observe only a ceremony on the occasion of a girl's first menstruation.

7 The Bushmen, living apart from any other peoples, have no human "outside enemies"; to them, outside enemies are lions, leopards, cheetahs and other large carnivores. They also fear the abstract enemy *g//wama* and the evils he bears.

8. Each of the groups of families indicated by the capital letters A,B,C, ...T in Figure 23 corresponds to a *cluster of families*.

9. Here and there in the Dobe area are springs and reserboirs in limestone depressions that provide water all year long.

10. "Areal group" signifies a number of adjacent camps which frequently exchange members, for example I,II,III, etc. in Figs. 28 and 29.

CHAPTER 5 DISCUSSIONS

The Bushmen live in the barren and inhospitable Kalahari Desert. The hunting and gathering peoples of the world are distributed over marginal lands such as the Arctic tundra, tropical rain forests, and deserts, where they practice neither agriculture nor animal domestication. All of these peoples have managed to survive by skilful adaptation to their respective environments. Since all of these societies share the common economic base of hunting wild animals and foraging for plants, they also have many similarities in their social structure; at the same time, however, there are many differences in their adaptive forms, for example in the relative degree of dependence on hunting or gathering, or in their responses to striking differences in environment.

Therefore one must take care when theorizing about the world's hunters and gatherers on the basis of Bushman society Although the present hunters and gatherers are not the same people as the so-called "ancient hunter-gatherers" who covered the globe during the diluvian age, we can say that certain of these ancient hunter-gatherers, due to having failed to discover such production methods as agriculture and animal husbandry, or because they were too far from other groups to import such methods, or because these methods were not suitable to their habitat, or because an abundance of natural resources rendered these methods unnecessary--for various reasons, they have to this day not developed past their ancient economic stage. Such peoples remain today only in marginal regions. Doubtless there were differences between their social organization and those of other ancient hunter-gatherers who lived in other areas and eventually adopted agriculture and husbandry; also while these other groups passed through revolutionary economic and social changes after the adoption of the new production methods, certainly the modern hunter-gatherers too must have gone through some social changes during the last 10,000 years. There are examples such as the Eskimos and Bushmen, who have adapted so well to their apparently hostile environments that they find it difficult to adopt another way of life; and the Siriono of South America, having tried agriculture for a while, returned to the depths of the tropical forests and their hunting and gathering economy, suggesting that such retrogression may have occurred at other times and places. Thus we must also take care when theorizing about the ancient hunter-gatherers on the basis of today's specimens and when attempting to chart the development from a hunting and

gathering economy to the stage of agriculture or animal domestication.

Nevertheless, there is no doubt that the ethnographic facts of the present-day hunter-gatherers hold many important keys for us as we try to reconstruct man's past history Particularly for the question of evolution of human society, our only resources are the modern hunting and gathering societies. Surely the common mode of subsistence of modern hunter-gatherers and the fluid group structure common to most of these societies must represent elements of primeval human society Further, can we not find further hints in the undeveloped kinship systems, the lack of occupational, status, and class differentiations, and the egalitarianism[1] which are so widespread among these societies? Even considering the fact that the Bushmen, living in the middle of the Kalahari, have followed a specialized path among hunters and gatherers; and even if there is a lingering chance that the extensive changes in environment and population brought about by external forces[2] have caused the Bushmen to regress from a higher level of social integration, I feel that the value the ethnographic facts of this society as a historical document pertinent to the evolution of human society is diminished not one whit.

With this in mind, I would like in the present chapter to attempt a comparative consideration of hunting and gathering societies, centering on the Bushmen.

With the aim of investigation the earlier forms of human society or even the origins of human society, I would like now to consider briefly the societies of non-human primates. Since the monkeys and apes are further from man both temporally[3] and genealogically than the ancient hunters-gatherers from the modern hunter-gatherers, the dangers of comparison are also greater Still, the work on primates by Imanishi and Japanese researchers, and more recently by researchers throughout the world, contain many facts that adumbrate the development of human society. Since monkeys and apes are man's nearest relatives, a comparison of societies will occasionally turn up significant clues to the evolution of human society. Recent work by Ikeda, Kawai, Itani and Imanishi considers in detail the traces of human evolution to be gleaned from monkey and ape materials (Imanishi 1968) In this chapter I will mostly limit myself to a few comparisons of Bushman society with that of the chimpanzee, whose group structure greatly resembles the Bushman's. There is much that is unknown about chimpanzee group structure, for example with respect to kin

relationships, and the comparisons will be very rough, so these remarks should be thought of merely as prolegomena to future research.

First, concerning food, the fact that most clearly distinguishes the Central Kalahari Bushmen from other hunting and gathering groups is that they obtain most of their water from gathered plants. There are few other hunter-gatherers in the world with so little water in their ranges. It is this fact also that causes the most difficulty for the Bushman's subsistence. Even among the Bushman, the !Kung and most other groups have a number of waterholes in their ranges. Then as to the main foods, the !Kung, as explained above, have a single very stable main food in the nut *Ricinodendron rautanenii*. This tree puts out a nut about 3 cm. across, encased in a hard shell which gives it great preservability. All through the year it is the main food of the !Kung Bushmen who live in that area; in fact, it is said to form more than two-thirds of their diet (Lee 1965, 1968a, 1968b) *Ricinodendron rautanenii* is found only in the northern Kalahari, Zambia and Rhodesia (Story 1958) and is rather unusual in the Kalahari. Only a portion of the !Kung have access to this nut, but they make it the predominant element in their diet. This plant, however, only grows on sand dune remains in the northern Kalahari, so most Bushmen probably have eating habits more like those of the Central Kalahari Bushmen. That is, in most of the Kalahari there is no plant which is abundant, nutritious and storable and thus has the capability (like *Ricinodendron*) to become the sole main food. The CK Bushmen bases his diet on a group of eleven main foods starring the root *Cucumis kalahariensis* and *Coccinia rehmannii* and the beans *Bauhinia macrantha* and *B. esculenta*. For peoples who survive mainly by foraging, the presence of a stable and abundant food supply is indispensable (whether a single food, as in the case of the !Kung's *Ricinodendron* and the California Indians' acorns, or several foods as with the CK Bushmen) [4]

Concerning range, the CK Bushmen of the ≠Kade area roam over an area of nearly 4,000 sq. km., whereas the !Kung of the Dobe area restrict themselves to a far smaller area. This difference is mainly a result of the limited movements of the !Kung around their waterholes and their intensive reliance on *Ricinodendron*, which grows densely, but only in certain spots; still, it can be considered the general difference between the living patterns of the !Kung, dwelling in a moister region, and the CK Bushmen who live in a drier region with less vegetation.

As for labor, Lee reports that among the Dobe !Kung an adult spends from 12 to 19 hours a week (7 days) finding food (Lee 1968) The average CK Bushman "provider" spends 4:39 a day, or 32 hours and 33 minutes a week. Thus the Ck Bushmen must spend about twice as much time in food-getting, another difference in life style which is clearly caused by differences in environment and type of food.

The Bushman is basically a gatherer Lee has provided some perceptive observations based on available data from other hunting and gathering groups (Lee 1968b). According to Lee, out of 58 hunting-gathering peoples, 29 subsist mainly on gathering, 11 on hunting, and 18 on fishing; moreover there is a close connection between subsistence mode and distance from the equator (*i.e.* latitude) Lee's data are shown in Table 17

As shown in the table, the most popular mode of subsistence at high-numbered latitudes, near the poles, is hunting, while fishing predominates in the middle latitudes and gathering in the lower latitudes. Lee also points out that with the exception of the Paraujano of south America all hunter-gatherers obtain at least 20% of their food from hunting mammals, which indicates the importance of hunting in their economies. Thus while there are hunting peoples such as the Eskimos, the Indians of the far north, and the Yukaghir of Siberia who hardly do any gathering at all, the gathering peoples living in the lower latitudes make game an important part of their diet.

Now let us focus on Africa, a likely spot for the process of hominization to have been advanced. The various hunters and gatherers remaining there include the Hadza and Dorobo of East Africa, the Pygmies of the Congo, and the Northern,Central and Southern Bushmen of southern Africa, all of whom get 60-80% of their food through gathering. Both the CK Bushmen and the Hadza of East Africa, where game is far more abundant than in the Kalahari, rely on gathering for 80% of their food; in consideration of this fact, even supposing that the natural environment has changed somewhat since the Pleistocene, it is hard to imagine that the ancient residents of Africa could have had a hunting-based economy Since plant food remains disappear without a trace in a relatively short time, as can be seen even in Bushman camps, we cannot expect them to be recovered by archeologists, but I think it likely that the former residents of Africa were also hunter-gatherers who subsisted mainly by gathering reliable plants (those that were always available in sufficient quantities) Among the apes, man's closest relatives, the gorilla and orangutan are strict

Table 17 Latitudinal Distribution of Hunting and Gathering Peoples with Respect to Mode of Livelihood

latitude	G	H	F	total
above 60		6	2	8
50 -- 59		1	9	10
40 -- 49	4	3	5	12
30 -- 39	9	-		9
20 -- 29	7		1	8
10 -- 19	5		1	6
0 -- 9	4	1		5
Total	29	11	18	58

G, H, F represent those peoples who support themselves by gathering (including gathering of shellfish), hunting, and fishing, respectively.

vegetarians, while the chimpanzee in known to eat meat *occasionally*. Man, however, hunts and eats meat *habitually*. The role of hunting in the evolution from ape to man, that is, in the process of himinization, is obviously an important one, but rather than having a quantitative importance in the livelihood of early man, I believe that it was the qualitative change in mode of living, the habituation to hunting due to the attractiveness of meat, that was significant. The development of habitual hunting has a deep and complicated relation to such matters as the establishment of sharing, sexual division of labor, establishment of a "lair" and the transporting of food to it, and in turn the rise of the family; these are not matters to be cleared up easily, so I will simply reiterate that it seems that early man based his livelihood on the more stable method of gathering.[5]

Just as present gatherers support themselves on a fixed array of main food plants, so we can assume that early man likewise could turn to abundant and stable main food plants. To be noted here is the intensive reliance of both the chimpanzees of the savanna woodland and the CK Bushmen on hard nuts, the beans of the *Caesalpiniaceae*. Chimpanzees generally eat leaves, stalks, flowers and berries, but those living in the savanna woodlands are heavily dependent on nuts such as *Brachystegia* (of the same subfamily as *Bauhinia*) from the middle to the end of the dry season (Itani 1966) The fact that both the CK Bushmen and the savanna woodland chimpanzees show an intensive seasonal reliance on a nut of the same subfamily *Caesalpiniaceae*, taken together with the fact that man's ancestors could not eat roots in the period before they had digging sticks , shows the importance of the *Caesalpiniaceae* nuts in the hominization process. Considering that both groups live in the region which links the forest and the open land, a prime setting for hominization, the importance of this subfamily of nut becomes all the more obvious.

Next let us deal with social life. The CK Bushman society is undifferentiated, with a low level of social integration--a "band level" society. Much research on the band structure of hunter-gatherers has been done among the Australian aborigines (Radcliffe-Brown 1930, Warner 1937), but there both kinship and political organization are developed, and patrilocal and territorial bands exist. Steward and Service both studied hunting and gathering peoples, including the Bushmen, and attempted a classification based on distinctive features of their residence groups, using such terms as patrilocal (or virilocal) band, territorial band, uxorilocal band, and

composite band (Steward 1955, Service 1962, 1966) The concept of "band" in those works applied to a lasting group with a fixed membership and territoriality and characterized by corporateness. But among the CK Bushmen the social group larger than the family (*i.e.* the camp) is a very fluid group and certainly should not be called a band in the sense of a corporate group. The same can be said of the !Kung and Hadza (Lee 1965, Woodburn 1968b) Turnbull and Damas, in their studies on the Pygmies and Eskimos respectively, both use the term "band" while at the same time stressing the fluidity of the groups (Turnbull 1968; Damas 1968). It is necessary to rethink the concept of the band in light of the existence of extremely fluid, unstable groups with no territoriality as seen among the CK Bushmen, !Kung and Hadza. Because of the insufficiency of research on the CK Bushman residence groups the argument cannot be taken too far, but if we examine thoroughly the structure of the Bushman and Hadza groups, which are at the lowest known levels of social integration, and fundamentally reconsider the concept of the band, I believe we will make some new discoveries about the consolidation of the family and about the evolution of human society.

According to recent research by Itani and others, the chimpanzees living in the savannas and forests of eastern Africa have a society different from those of other monkeys and apes in that they form very fluid large groups (Itani 1966, 1967, 1972, Itani and Suzuki 1967, Sugiyama 1967, Nishida 1967, 1968, 1970, Suzuki 1969, Nishida and Kawanaka 1972) The individuals forming these groups usually form smaller subgroups of a few members for the purpose of food gathering--groups consisting of adults only, men only, mothers only, etc. The observers call these smaller groups such things as "child-rearing groups" and "sex groups", and since they frequently change their composition they are also called "temporary groups," "nomadic groups," etc. Later, in Filabanga in 1965, Itani and Suzuki observed in detail the patterns of a large group of 43 chimpanzees on the march; they noticed that the ranks of the procession were divided into a group of mothers and children, a group of males only, and a group of females in heat. In other words, it was clear that the small groups that had been given various names were by no means randomly formed temporary units, that the large group consisted of the smaller groups, and that within the framework of the large group there seemed to be alliances and splits among the various small groups. If these facts turn out to be true of chimpanzee

society in general, then not only is chimpanzee society different from any other monkey or ape society, but it can be said to bear a close resemblance to the loose, fluid hunting-gathering society we have observed among the Bushmen. Next let us compare the formation of the CK Bushman and chimpanzee societies. In line with the agreement on names by Japanese chimpanzee researchers in 1968, the larger group will be called the unit group and the smaller group the subgroup.

Among chimpanzees sharing, hunting and meat-eating all exist, but only at a rudimentary level and not habitually. Therefore there is no division of labor among individuals, and all chimpanzees other than suckling infants must support themselves, self-sufficiently and individually. In short, among chimpanzees it is the individual who is the unit of subsistence. Among man (hunters and gatherers), on the other hand, it is the family, with its division of labor between man and wife and between providers and dependents, which is the self-contained subsistence unit. Now let us compare chimpanzee and Bushmen groups on the assumption that the individual in chimpanzee society corresponds to the family among Bushmen. In chimpanzee groups, almost all young adult males leave the troop. In chimpanzee society there is no specific enduring sexual union between a male and a female; instead a kind of group marriage exists in which a number of males jointly possess a number of females, and children are reared only by their mothers. One suggested reason for the departure of young males from the troop when they reach sexual maturity is that it is a mechanism to prevent sexual relations between mother and child. The exodus of young adult males is indeed an interesting problem, but since distinctions of sex and age are extremely undeveloped, I will discard all detailed theories based on sex and age and take all individuals to be equal units; then it is possible to try to compare these units with the Bushman family units.

Chimpanzee subgroups are variously constituted of males only, females only, both males and females, mothers and children, etc., and the subgroups split up and reform after a few hours. This is rather different from the shifting alignments seen among hunting and gathering groups; but disregarding sex and age differences as suggested above, we realize that these are food-getting groups consisting of several subsistence units, that they are extremely unstable groups which frequently interchange member units, and that they thus correspond to Bushman camps. The fundamental difference between the chimpanzee subgroups and the Bushman camps is that the Bushmen have a fixed sleeping place, a camp or a hut, whereas the chimpanzee

have none. This point too must always borne in mind when comparing the two.

The larger group embracing a number of these ever-shifting subgroups is called the unit group, and corresponds to the areal group of some 200 people in the ≠Kade area (cf. circles I,II, and III in Figure 28, Chapter 4).

On the comparison of chimpanzee and Bushman group organization can be summarized as in Table 18. This table clearly shows the remarkable correspondence between group composition among chimpanzees and Bushmen. As long as we look at it from the point of view of subsistence, chimpanzee group structure closely resembles that of hunting and gathering peoples; moreover, we also see that it is receptive to the emergence of the family The Bushmen hunt, and hunting contributes an important part of their diet, but it is gathering that forms the basis of their livelihood. Accordingly we can say that both the chimpanzees and the Bushmen have the same mode of subsistence; nomadic gathering. We can understand the common features of their societies--lack of social specialization (no leader, egalitarianism, poorly developed division of labor, etc.), fluidity and freedom--as well as the similarities in group formation, to be some of the adaptive elements found in nomadic gathering societies; and we can also take it all as an example of social evolution through adaptation. So the form of chimpanzee society has much to suggest about the origin of human society These kinds of resemblances between chimpanzee society and human society of the hunting and gathering stage offer support for the hypothesis that human society arose, neither from a society like those of the gibbon and gorilla, has regular male-female ties and small family-like troops,[6] nor from a society like those of the macaques and baboons, has large troops and develops social differentiations such as leader, class or rank systems, but rather from a society like that of the chimpanzees, the only non-human primates to have a free and fluid social structure like that of human hunter-gatherers, and then with the emergence of the family human society arose.[7] The fluid chimpanzee group structure, as we have seen from comparison with the Bushmen, made possible the development of the family, a distinctive feature of human society

Notes to Chapter 5

1. There are hunter-gatherers with advanced social organization, like the Northwest Coast Indians of North America and the Australian aborigines, but most of them, like the Bushmen, Congo Pygmies, Hadza of eastern Africa, and Eskimos of the far north, have a very low level of social integration

Table 18. Composition of Chimpanzee and Bushman Groups

number of living units (average)	1	10	40
Chimpanzees	individual (1)	subgroup (10)	unit group (40)
Bushmen	individual (1)	family (5)	camp (50)	≠Kade areal group (200)

Bracketed figures shaw number of individuals.

and specialization.

2. Oppression due to the northward incursions of the Boers and the southward expansion of the Bantu since the seventeenth century have decimated the Bushman population and driven them into the depths of the Kalahari. See Chapter 1.

3. While we can place the ancient hunter-gatherers in a period from 10,000 to at most 1,000,000 years ago, the splitting-off of man's ancestors from the monkeys and apes dates to the Tertiary period, some 10 million years ago.

4. According to Woodburn, the Hadza systematically gather only a few of the many food plants available to them. From the standpoint of quantity, a mere ten types of plant make up the bulk of their diet (Woodburn 1968a).

5. A big game hunting economy, as seen among the European hunters who appeared towards the end of the Pleistocene period and the North American Indians who still hunted until comparatively recent times, doubtless was the result of especially developed form of adaptation; and the existence of full-time hunters at high latitudes is a specialization in response to the paucity of food plants in the environment. In both cases they emerged rather late in the history of man's evolution, so that we can disregard them in our discussion of the subsistence modes connected with the hominization process.

6. Imanishi has called small family-like groups like those of the gorilla "familoid" (Imanishi 1961).

7 The hypothesis that the family arose within a loose society like that of the chimpanzees after a band structure had developed was proposed by Itani. He considers the chimpanzee unit groups to be the precursors of the hunting and gathering bands, calling them "pre-bands" (Itani 1966, 1967; 1974, Itani and Suzuki 1967)

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